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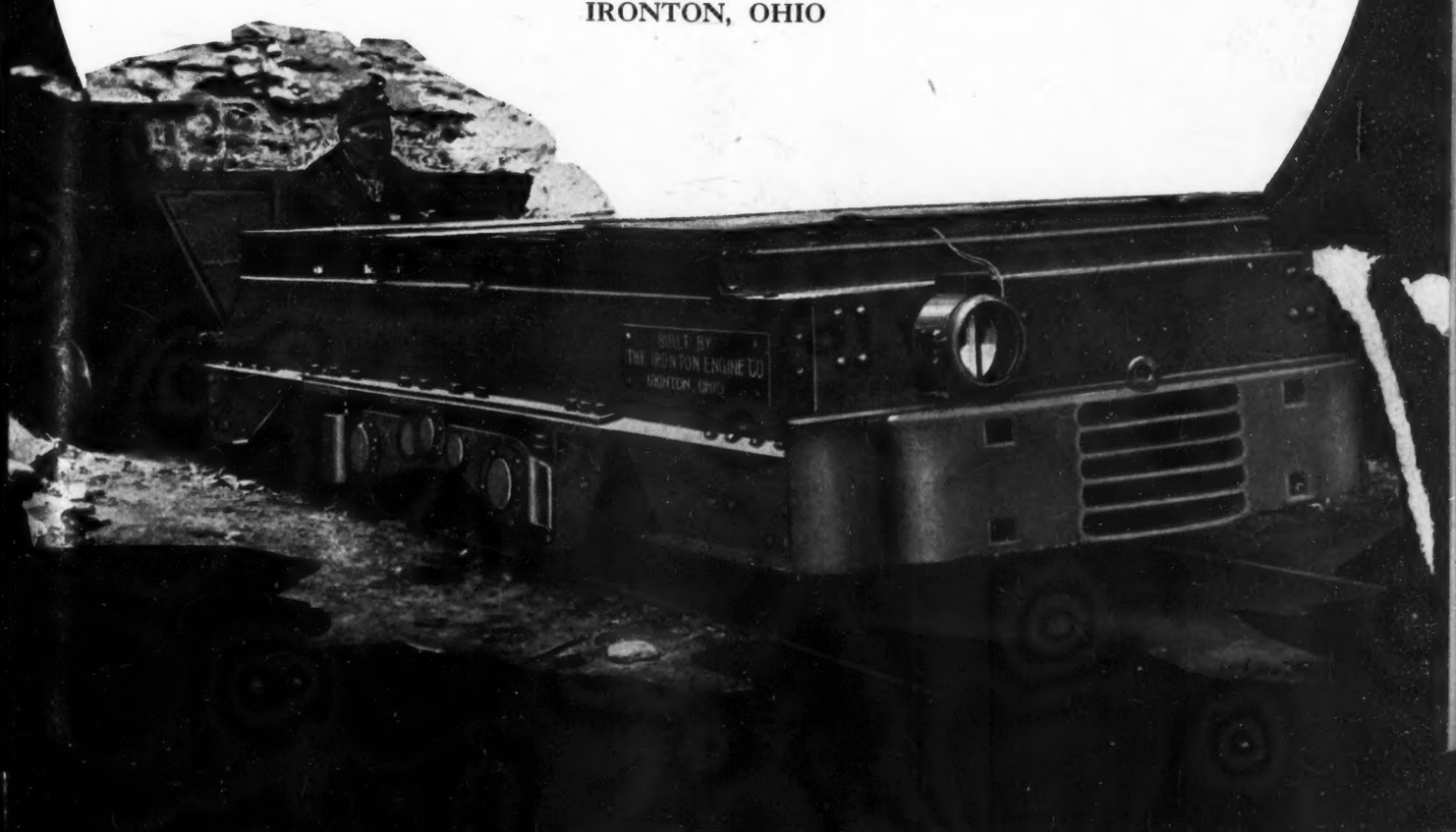

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COAL AGE

The Only National Paper Devoted to Coal Mining and Coal Marketing

C. E. LESHER, *Editor*

Volume 24 NEW YORK, SEPTEMBER 13, 1923 Number 11

Credit Pinchot

ALL records were broken by Governor Pinchot when in two weeks he brought the anthracite operators and mine workers together on a settlement. Although neither side wanted a strike both gave every outward appearance of a willingness to see one through to a finish. But their heart was not in it. Nor was the consumer at all interested in having a grandstand seat at such a performance. It has loudly said "enough" and expressed its preferment for coal to contest. Nor did it rise to the bait of soft coal for the winter.

The Governor wants the credit; he should have it—all. He took on the job voluntarily; no one asked him in, other reports to the contrary, notwithstanding. The administration at Washington, acting through the Coal Commission, held and maintained the position that it was the business of the contestants to put their own house in order. Governor Pinchot, however, gets the credit for having justified Mr. Hammond's optimism.

Direct negotiations having failed twice, the Governor proceeded with his self-appointed task as savior of the country and of the treasury and well-being of the magnificent Commonwealth of Pennsylvania, in good sound trading fashion. He took counsel with the idealists and acted practically. He first assembled his facts. Here they are:

The public wants coal and not a strike. Fact one.

Controversies of this character when arbitrated always end in compromise. Neither side gets what it wants but takes less. Why, therefore, waste time? Get down to business at once and have it over with the sooner. Fact two.

The operators can be forced to come to terms at any time, so find the best possible terms the miners will accept and you have—Fact three.

The Republic expressed its gratitude to President Roosevelt for settling one anthracite strike. Fact four.

The other facts he had, or could have had, or thought he had, were just statistics. The statistics show, for instance, that with few exceptions the men working 200 or more days per year earn from $1,200 up to more than $4,000. The minimum outside day wage is $4.20 and some contract miners average $14 and more per day. Adding 10 per cent to each raises the lower-paid group by $120 per year and to those already high it adds $400. The Governor's plan of justice for all means 42c. per day to some men and $1.40 to others. Thus he pricks a sore spot deeper.

"Yes, yes," one can hear him say as he registers impatience and worry, "that is some thing for the future, because to fix up those inequalities now would take at least six months. The prestige of this job demands action." So he sticks to his own facts. The only statistical fact that he needed was the amount his 10-per cent increase in wages would add to the price of coal. He announced a minimum on that and told the people that though they would have to pay it, they should not, and that maybe some time, some way, they would not. Why bother, anyway, as they are to get anthracite to burn?

Just sum up Mr. Pinchot's achievements. The miners are satisfied. In fact they displayed unseemly haste in accepting the Governor's last proposal, the press account of the meeting on Friday of last week noting that four minutes after Mr. Lewis stated it to the full scale committee it was accepted. Capellini was so delighted that he stood on his head. It is a good deal for them because it is a gain with no losses.

He took the responsibility off the operators of naming an increase and telling the public what it would cost them. If that was to be the outcome, the producers should be grateful. He shortened the strike to a mere vacation, for which the public is appreciative. He added nearly a million dollars a year to the treasury of Pennsylvania. For this his constituents will have no complaint.

Governor Pinchot is entitled to the credit; let none withhold it.

Cogitation for Soft-Coal Operators

THERE is enough in the anthracite settlement and the manner of its coming to give the soft-coal industry food for considerable thought this winter. The strike was avoided as a matter of political expediency and by giving the miners nearly half the wage increase they had demanded. No one but the officials of the United Mine Workers and the *New Republic* claimed that as a whole they really needed more money. The earnings of the best-paid class without the increase are comparable with top notchers among the soft-coal miners.

Next spring the soft-coal mine contract will expire. It will be a presidential year and a strike would be considered most unfortunate. It is a safe guess then that the mine workers will weigh their chances of winning and will demand a 10-per cent increase. This one came so easy for the hard-coal workers as to hearten the soft-coal men.

Against this must be considered the market possibilities. By now the stock of soft coal in the hands of consumers is close to 60,000,000 tons. This is a high figure, but no more than is warranted in view of the character of industrial activity and the warnings of the railroads that they would need their facilities this autumn for other products. If, as seems to be happening, consumers scent a strike in the soft-coal fields next April, they will keep these stocks for possible later use and buy for current use this fall and winter. If as spring approaches a strike seems imminent, more coal will be stored.

This anticipation of a strike alone will hold up the market this winter. Without it prices will drag. The usual fall snap will be absent because consumers are so well fortified with stocks. It is hard to get a buyer excited when he has two or three months' supply on

hand, though when a buying panic starts none is immune.

With a dull market behind them the union soft-coal operators will be little inclined to grant a wage increase. Instead, they will think back on 1921 and, considering the possibility of non-union competition with reduced wages, will want a reduction of wages in their next contract. A downward reaction in the business world next year will intensify this feeling.

That the check-off has been given such scant attention by Governor Pinchot and by the Coal Commission will give the soft-coal operators ground to hope that they can succeed in throwing it out. The possibility will be attractive to the operators.

Some hard-coal dealers are free to predict that they will be seeking orders for hard coal by Jan. 1. The steam sizes of anthracite will have hard sledding against soft coal this winter and Mr. Lewis may hope to return the favor to the hard coal operators by raising the cost of the soft coal that competes.

Meanwhile with production of bituminous coal over 11,000,000 tons a week car shortage is appearing in the East. The strength of the market will be known when buyers decide to take it or leave it as prices stiffen up.

How Different!

SEVERAL coal-mining engineers went on the trip to Ontario and Quebec with the American Institute of Mining and Metallurgical Engineers, and found the practice quite different in the metal mines from that in coal mines. These engineers are wondering—still wondering—that at one mine rock is being extracted and loaded for 17½c. per ton, that in the same workings wages averaged about $4.50 per day for tonnage men and that the output per miner was about 26 tons. In fact the manager said he would not keep a miner on the job who could not load his 20 tons daily.

How different it is in the union mines of the United States, where the output is kept low, and the consumer, whether workingman or capitalist, is compelled to pay many times 17½c. per ton for the mining of coal in order that the miner can make big pay out of moderate output.

Along with the party in Canada was the Minister of Mines of Ontario, who genially and with pride stated that about half the selling price of the metal product in that province was profit. If that could be said of anthracite mining how great would be the lamentation on all sides, Canadian and American! As it is, with less profits in coal mining than in the mines of Ontario the public is continually demanding investigations. Canada is hardly a foreign country, but conditions in the mining regions of Ontario and Quebec looked strangely different from those in union coal mines of the United States; so different that it might have paid the U. S. Coal Commission to be along to ask just why these things should be so.

But, after all, perhaps it is no great loss that the facts of the coal controversy are not exposed. The public and the politician do not want to know the truth for that would hamper them in following their purposes to the end. Even the most upright of men are disposed to seek the expedient course. The public must save itself from coal shortages and high prices, the politician, or statesman, if you will, must carry popular approval with him. So both are disposed to hedge when coal problems are at issue, and both try to back an improper judgment with the best reasons and most convincing half lights they can contrive to find.

Everybody is prone to say he would execute judgment, but when the time comes he is likely to do what he is asked to do by the aggressive voter or what he thinks can be done with the least resistance, and he calls that justice, though he knows it is not. The wonder is that our judges are so free from this weakness which assails almost every other kind of public official and many of our newspaper editors, finding them utterly defenseless against its attack.

Earthquake in Japan

IN THE thickly inhabited area occupied by Tokio, Yokohama and Yokosuka, an earthquake probably unequalled in history in its death roll and damage recently occurred. Apparently it did not cover a large area—the three cities are not far apart, Tokio being about 20 miles from Yokohama—but it struck at the business center of Japan, razing the buildings while waves from the ocean, broken pipe lines, grounded wires and house and industrial fires completed the destruction and added to the number of victims.

The Japanese will bear their affliction with resignation and stoicism, as is their practice. They will rebuild their cities and will take up the thread of life where the earthquake snapped it. They will use their marvelous advances in surgery and hygiene to reduce as far as possible the effects of the catastrophe.

Their resources are not greatly reduced by the disaster. Advices are none too complete or reliable, but so far nothing seems to have been received that would indicate that the disaster seriously affected Osaka, Kobe, Kioto or Nagoya, four cities exceeding Yokohama in size, though all smaller than Tokio.

The main manufacturing and mining regions probably are not much, if at all, affected. The coal fields of the island of Kyushu lie five hundred miles to the southwest and those of the island of Hokkaido an equal distance to the north. There are coal mines on the extensive island of Nippon, where the earthquake occurred, but they are relatively unimportant except those in the Joban field, which is an active district and near the point of disturbance.

In view of the size of the islands, the great length of the crescent they occupy and the small area subjected to the earthquake shock the real sources of the wealth of Japan—its mining and manufacturing and the indomitable industry and will of its people—are not destroyed. In consequence the Japanese nation will recover speedily, even though it may be found that Tokio and Yokohama are no longer as suitable for large centers of population as in the past.

The United States sincerely condoles with the Japanese in their misfortune and is anxious to exhibit its sentiments and good will in something more substantial than mere words. There is need for money to care for the many dispossessed Japanese in the cities which earthquake and fire have destroyed. For these reasons the American Red Cross is making collections. Surely where the suffering has been and is so great the width of the Pacific Ocean and the profundities of the great Tuscarora deep will not act as bars to our good will and assistance. A people 110,000,000 strong such as ours should be able without much self-sacrifice to minister adequately to the sufferers of the small area of Japan thus terribly afflicted.

General View of Navajo No. 5

Navajo No. 5 Mine Turns Waste Piles Into Power and Solves Water Problem with 2,882-Ft. Well*

Boilers Operate Full Blast with Low-Grade Fuel and at a Low Rating with Bone—Precious Water Supply Is Derived from Three Levels in a Single Well and Purified

BY H. B. COOLEY
General Superintendent, Allen & Garcia Co., Chicago, Ill.

POWER for Navajo No. 5 mine of the Gallup American Coal Co., near Gallup, N. M., as well as for the company's old slopes now being worked out, is supplied by a central plant conveniently located adjacent to the main shaft. Provisions have been made for an ultimate boiler capacity of 2,514 boiler hp. (manufacturers' rating) and a total generating capacity of 6,000 kw.

The boilers, turbines, condensers and a part of the plant auxiliaries and piping were furnished from other plants of the operating company. Consequently the problem of the engineers consisted mainly of the proper assembly of these units and the combining of them with such new equipment as was necessary for satisfactory and economical operation.

Every effort was made to modernize this second-hand equipment and to bring it up to the standard of present-day power-plant practice. By a redesign of the boiler setting, the selection of high-grade stokers and the application of forced draft and superheaters the boiler installation developed into a very satisfactory plant. In like manner the application of direct-connected exciters to the turbines and the adoption of surface condensers for the old jet condensers eliminated all the objections to the use of this second-hand equipment.

It is certain that the saving in initial investment much more than offset any slight advantage that might have been gained by using new equipment throughout. Too often the danger in carrying out such a program is the tendency to attempt the use of second-hand equipment which is not suitable for the conditions imposed. A loss rather than a saving may result, especially when the plant operation is in any way handicapped.

There are a few features of unusual interest in the general layout, and perhaps the most interesting details are in connection with the boilers, water supply and labor-saving accessories.

As is the case with practically every other coal-mining plant, the first requisite of a satisfactory boiler plant is the ability to utilize cheap fuel consisting of slack and refuse, which represents the unsalable product of a coal operation. That this plant has been able to do this is evidenced by the fact that much slack and refuse which had accumulated through years of operation of a neighboring mine have been utilized as fuel.

The present boiler plant (Fig. 1) consists of four 419-hp. horizontally baffled Heine boilers, each of which is being served by a forced-draft Harrington stoker 7 ft. wide by 14 ft. long. These stokers are capable of operating the boilers continuously at 200-per cent load with a fuel having 10,000 B.t.u. heat value and a total non-combustible content of 27 per cent. The rating of 200 per cent continuous or 250 per cent for short periods is set as the maximum at which this type of boiler should be operated. The stokers are suited for operation, but at reduced ratings, with fuel having as much as 45 per cent of non-combustible material.

The grate area of the stoker is sectionalized into four compartments so that the air pressure can be properly controlled by dampers over four areas independently, thus providing the proper quantity of air for each combustion zone.

The draft is furnished by motor-driven high-speed fans discharging into a common duct, the quantity of air and the pressure being controlled by a damper in the discharge duct. A concrete chimney 10 ft. in diameter by 240 ft. high provides the natural draft for removing the furnace gases.

The stokers are driven by independent vertical steam engines, and the stokers and the air pressure in ashpit and furnace are all automatically controlled by an Engineer Co. installation providing balanced draft control. The speed of the stokers and the air pressure in the

*This is the third part of Mr. Cooley's article on Navajo No. 5 mine. The first part appeared in *Coal Age*, Aug. 2, and the second on Aug. 16.

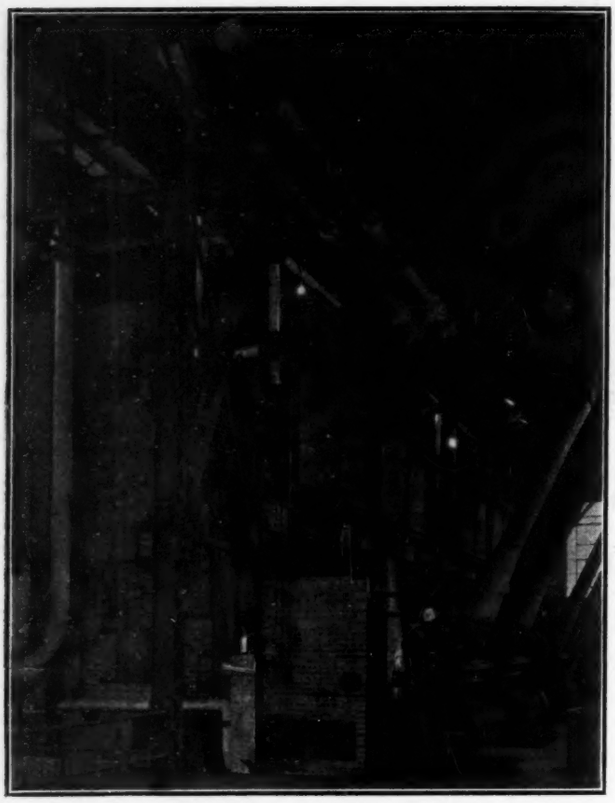


FIG. 1—BOILER PLANT BUILT FOR MAXIMUM ECONOMY

The pressure on the top of the fire is just a little over atmospheric, so there is no tendency for air to enter from outside through leaky doors or side walls, as is the case where there is a heavy vacuum. The pressure is regulated so that the fuel, which is sub-bituminous and tends to disintegrate in the fire, will not leave the grate surface.

ashpit are controlled primarily from the steam pressure. The pressure over the fire is controlled by a furnace-pressure regulator, and is set to hold approximately 0.08-in. pressure over the fire. A low pressure above the grate is essential for this installation because this coal disintegrates in burning and with a high draft the particles thus formed have a tendency to leave the grate surface with the furnace gases.

Up to the present, with a normal output up to 1,600 kw. and peak loads up to 2,000 kw., two boilers ordinarily have been carried on the line, but for short periods loads up to 1,600 kw. have been carried on a single boiler. With the load equally divided on two boilers the operation is extremely economical. The boiler and stoker efficiency range around 70 per cent with 14 per cent of carbon dioxide.

Steam Superheated in Tubes of Foster Type

The boilers are set with the front headed 12 ft. above the floor line, which provides proper combustion-chamber content considering the characteristics of the fuel and the ratings at which the boilers are to be operated.

The superheaters are of Foster type and are located in the rear of the combustion chamber, being placed at a slight angle with the horizontal. The steam in them is superheated mainly by radiant heat. These superheaters are supported on cast-iron pipe of 6-in. and 8-in. diameter which have open ends that provide for a circulation of air of sufficient volume to prevent the pipe from being burned out.

Fig. 2 shows provisions for both a high-pressure water back and for high-pressure water cooling of the pipe supporting the superheater support. It was later decided that this support could be properly maintained by air cooling alone.

The water back was entirely eliminated as being unnecessary, the air being sealed satisfactorily by an ash seal approximately 3 ft. long below the stoker chain. Owing to the fact that the ash pits are practically airtight and that the air pressure in the combustion chamber is held a trifle above atmospheric not much air courses over the rear of the stoker.

Several rows of Carbofrax brick are set along the side of the furnace directly above the grate. After much investigation, E. J. Franklin, consulting mechanical engineer for the coal company, recommended the installation of this material as a preventive against clinker adhesion, despite the fact that the temperature of the furnace approaches the melting point of the ash.

When driven hard the fire attains a dazzling white heat, and the slag or ash which adheres to the wall will melt down and drip off the sides. When the furnace operates at low ratings this slag will form again and will be melted off again whenever the temperature is increased sufficiently. Both the arch and the brickwork are thus well protected by this coating of ash, and it appears certain that the maintenance cost will be reduced to a minimum.

Fire Arch Is Supported by Steel Beams

Attention also is called to the method of supporting the Liptak arch. It will be noted that this is a double suspension arch carried by steel beams. These beams do not, however, rest on the side walls of the furnace setting, but are carried by steel columns independent of the brickwork. This method of support not only relieves the brick walls of a tremendous load, thus preventing cracking, but also enables repairs to be made on the side walls without disturbing the arch support.

The supply of water to the boilers is controlled by "Stets" feed-water regulators. Approximately 15 lb. of excess pressure is carried against these regulators, and when operated in conjunction with pump-pressure governors the water regulation of the boiler is automatic. Separate water columns are used and a bypass provided so that the feed of the boiler can be controlled by hand if necessary.

Coal is fed by gravity to the stoker hoppers from overhead bunkers. A Merrick Weightometer is installed on the conveyor that carries the boiler fuel to the bunkers. This device automatically registers the tonnage delivered to the power plant, enabling the management to determine the coal used in the power house and to check the railroad shipping weights against mine weights. This is a desirable feature as the miners are paid by the ton for the coal they load, and this furnishes a check against the total of the weights of the individual cars as recorded for them.

The stokers deliver the ash to enclosed hoppers located below the boilers in the basement. The ashes from these hoppers are drawn into a steel-lined ash car and are at present used for surfacing the mine yards and roads adjacent to the mine. When these ashes are no longer required for this purpose they will be dumped from the car onto an ash dump near the plant.

In the generating room are already installed a 1,500-kw. turbo-generator unit and three 500-kw. units. Provisions have been made and space left in the building for a 2,000-kw. unit.

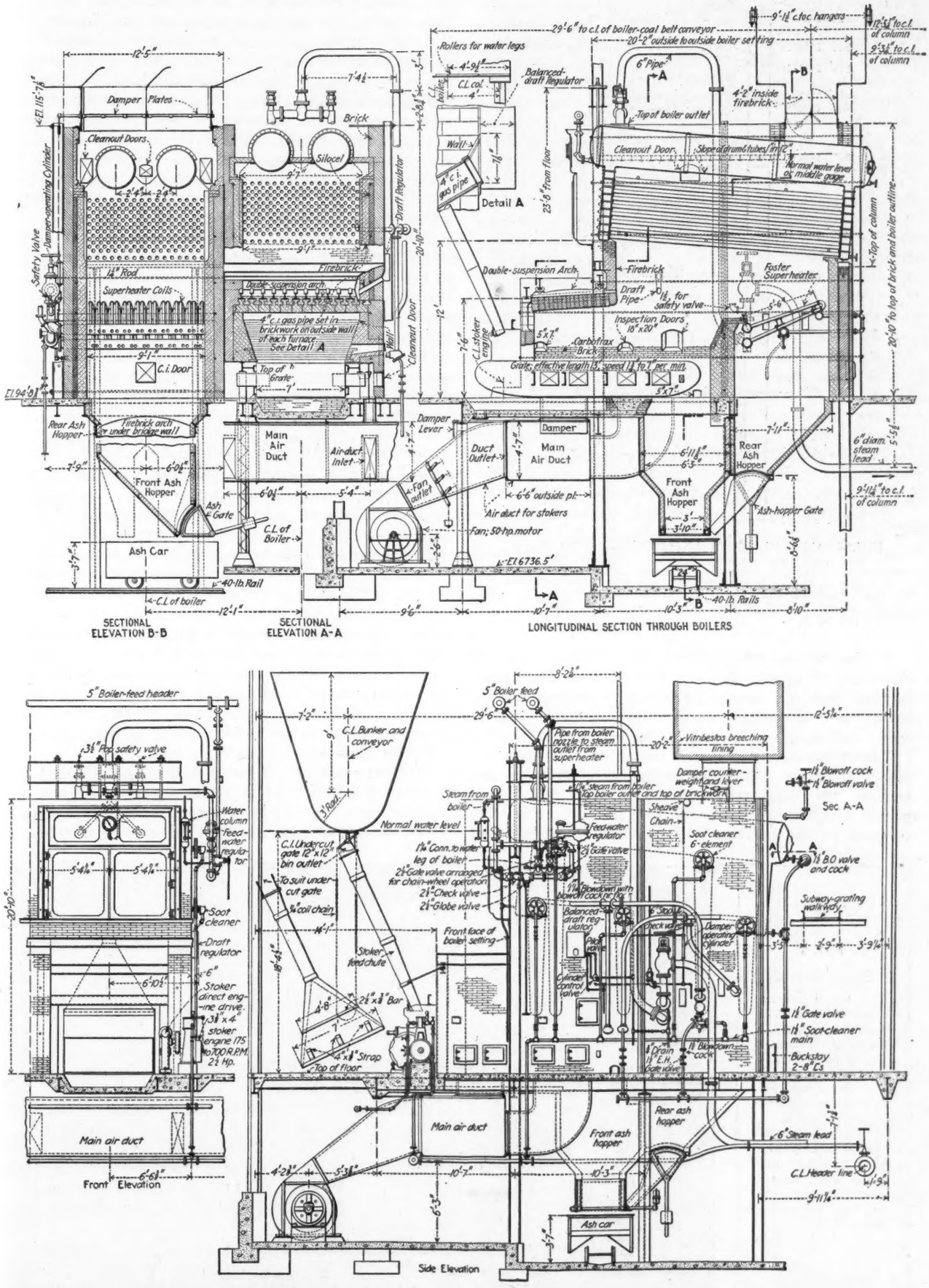


FIG. 2—WATER-TUBE BOILERS WITH CHAIN-GRATE STOKERS, SUPERHEATERS, SUSPENDED ARCHES, SOOT CLEANERS AND FORCED AND CHIMNEY DRAFT

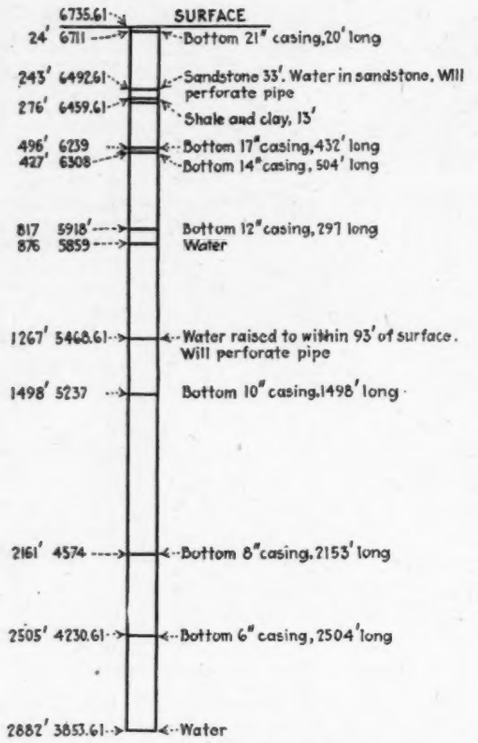


FIG. 3—CASING SIZES AND WATER CONDITIONS

The first water encountered was 300 ft. down, but the water obtained in sinking the hole to its final depth rarely rose above a point 600 ft. from the surface. Finally at a depth of 2,882 ft. a sufficient water supply was tapped. The water now rises to within 100 ft. of the mouth of the hole, the capacity being about 125 gallons per minute.

All the turbines are provided with surface condensers which are fitted with Wheeler Rotex air-and-condensate removal pumps. Condenser water is recirculated by sprays over a concrete basin 180 ft. long by 160 ft. wide, the spray equipment consisting of 162 nozzles.

The switching equipment is located in a switch room adjacent to the generating room. The switches are remote, manually controlled from the switchboard panels, which are placed in line with the main supporting columns of the building and serve as a wall between the generating room and the switch room. Sufficient panels with their switching equipment are supplied for the control of the generators, auxiliaries and segregated feeders to the various circuits above and below ground.

The water supply for boiler use is one of the interesting features of this plant. Flowing streams or dependable reservoirs are unknown in this section of desert county, and the railroads and former mine operators soon learned that deep wells were the only source of water supply. The mine provides only a small quantity of water; in fact the mine pumps provide only enough water to supply the miners' wash house.

The single well which at present supplies the power plant is 2,882 ft. deep, and the log, as briefly recorded in Fig. 3, gives the size of the casing at various depths. Water was found at the 300-ft. and 1,250-ft. levels but not in sufficient quantities to insure an adequate supply. The water rises to within 100 ft. of the surface, and tests show the capacity of the well to be about 125 gallons per minute. This capacity will be greatly increased when perforated casing is installed at the 300-ft. and 1,250-ft. levels.

Boiler Water Raised from Well by Air Lift

An air lift is used for raising the water to the surface, a No. 4 Ingersoll-Rand footpiece being supplied with air from a 16-in. and a 7x10-in. compressor driven by a 100-hp. motor. Many of the difficulties encountered with the air lift have been overcome by the mining interests of the Southwest and all the experience gained by the Allied-Copper Co.'s installations were available for this work.

The water thus obtained (Table I) is pumped at much expense and every possible precaution is taken to prevent waste and to return to the system in the form of condensate as much of the generated steam as is possible. Compensation is made for the unavoidable losses of water in the boiler system by make-up water supplied from a water-purifying plant.

Ordinary methods of water treatment did not appear to meet conditions or to be adaptable to this water, especially as some of the impurities, notably the chlorides, were difficult to remove. In order to provide that

FIG. 6

Switchboard

This board has remote manually operated circuit breakers controlling the generator and feeder circuits. It will be noted that it has a dead front, all the wires being in the rear. The panels line up with the building columns and do not project into the main generating room.

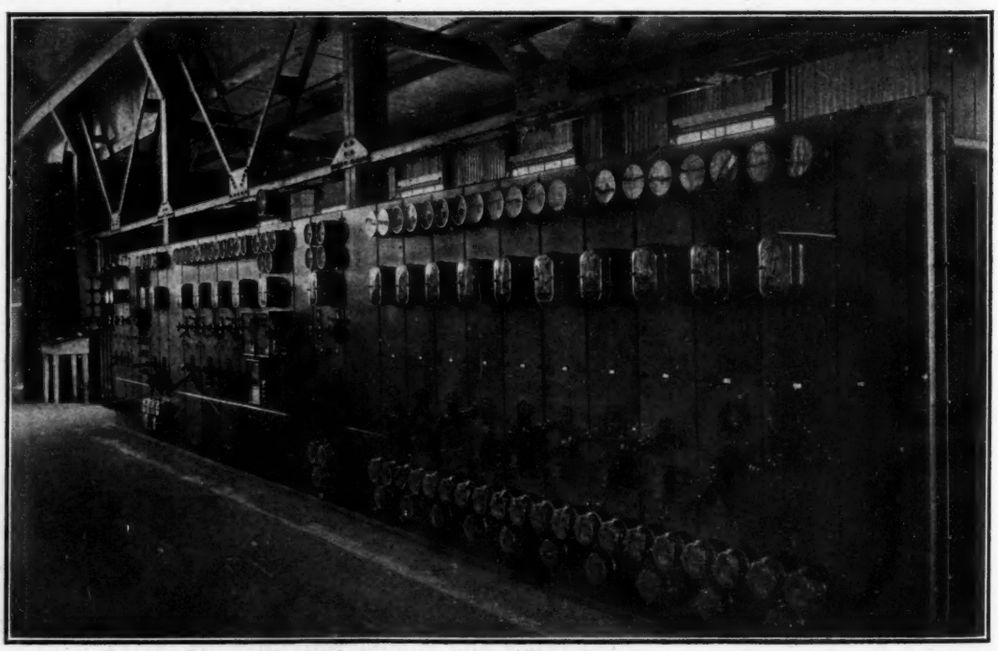


TABLE I—ANALYSIS OF WATER OBTAINED FROM 2,882 FT. WELL

	Grains per Gallon
Silica	0.736
Oxides of iron and aluminum	0.128
Carbonate of lime	7.618
Sulphate of lime	4.397
Carbonate of magnesia	3.822
Sodium and potassium sulphate	16.829
Sodium and potassium chlorides	0.850
Sodium and potassium nitrates	Trace
Loss, etc.	0.193
Total soluble mineral solids	34.573
Organic matter	Trace
Suspended matter	0.292
Total soluble incrusting solids	16.701
Total soluble non-incrusting solids	17.872
Pounds soluble incrusting solids per 1,000 U. S. gallons	2.30
Pounds soluble non-incrusting solids per 1,000 U. S. gallons	2.55

the water would be pure and at the same time to prevent any waste of water and of heat an evaporator or system furnishing distilled water as "make-up" for the plant losses was installed. With this system all impurities are prevented from entering the boilers and all expense from scale, boiler blow and priming is eliminated.

The evaporator system is of the double-effect high-heat level type. High-pressure steam from the boilers enters the coils of the first-effect evaporators and in condensing, evaporates the water in the shell. The vapor thus formed passes to the second-effect evaporator coils and repeats this process. The vapor from the second-effect shell is condensed in a high-heat level condenser using boiler feed for circulating water. This also is the path of the bulk of the heat in the steam supplied to the evaporators, so this heat is not lost but returned to the boilers as increased feed temperature.

The drains from the evaporator coils and high-heat level condenser are normally returned to the plant open heater, but can be pumped direct to the boiler-feed line if desired. The evaporator-feed water is heated in an open heater by exhaust steam from the plant auxiliaries to a temperature of 198 deg. F., which is nearly the boiling point at the altitude of Gallup (elevation, 6,750 ft.). This degases the water as soon as it enters the system, and as an extra precaution the contents of the plant open heater are held at nearly the boiling point by the hot-coil drains and the exhaust steam.

Griscom-Russell high-pressure submerged multicoil evaporators are used. There are two units per effect or a total of four evaporators. The coils of the evaporators are entirely submerged and are covered with an enveloping baffle in order to prevent the possibility of priming. The evaporators are entirely self-scaling. Scale is removed every eight hours. Just after the evaporator shells have been emptied and refilled with cold water, live steam is turned into the coils, and their resulting distortion cracks off the deposit of scale, which falls to the bottom of the shell and remains there during the eight hours, being blown out when the shell is emptied.

Each shell is provided with a float control to maintain automatically a constant and continuous blow sufficient to carry off the impurities in the water. This, however, can be changed to an intermittent blow-down if conditions should prove that to be more economical.

The relative location of the units comprising the evaporator system are shown in the power-house cross-section (Fig. 5). The evaporators are in the basement, the mixing tank and plant open heater on the boiler-room floor and the high-heat level condenser is located on a platform high enough so that the drains will return by gravity to the open heater.

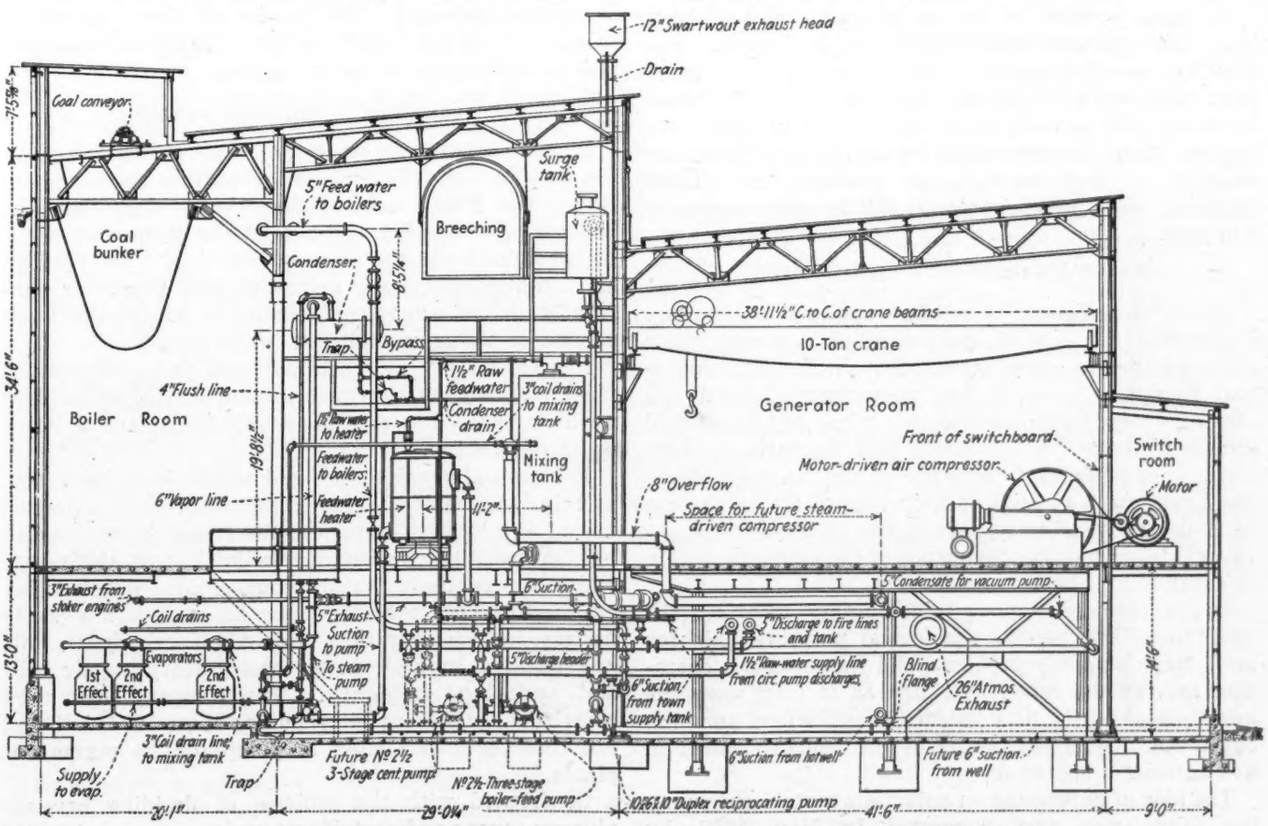


FIG. 5—CROSS-SECTION OF POWER HOUSE SHOWING EVAPORATOR SYSTEM

With only about 125 gallons per minute to draw on and that supply perhaps none too certain, every care had to be taken to economize in the use of water. For this reason it is used over and over again, but this has an advantage in that the water remains pure. Whereas others are continually purifying the water they use, the water at Navajo No. 5 is made pure once and for all and used repeatedly.

Revolutionizing Mine Pumping with Automatically Primed, Started and Controlled Centrifugal Pumps

Development of Automatic Equipment—Application of Simple Devices to Complex Operations—Advantages and Economies Realized—Details of Equipment and Operation

By Edgar Gealy
Electrical Engineer; Associate Editor, *Coal Age*

AUTOMATIC operation of simple devices is now quite common, but its application to complete operations of complex machines is still new. There was a time when it was considered highly desirable to depend upon the human factor in the operation of equipment, but gradually and slowly mechanical and electrical devices have been perfected to a degree which has proved them to be more reliable than the human element. Many of these simple devices are performing their duties with almost unquestionable exactness and regularity. Therefore the application of these simple automatic devices to complex operations is the real engineering pioneer work of today.

Many of the most arduous operations that must be done around the coal mines are now being done by the use of machinery. In the application of this machinery thought was not always given to the possibilities of automatic operation; in fact, many engineers and mine managers lost sight of the idea as greater safety and economies were being realized through the greater application of machinery.

No small number of simple protective devices have been developed and applied about the coal mines. The need has been apparent and their value and importance have been well established. The combination of these ideas has only recently made possible the automatic reclosing circuit breaker and the automatic converting substation. Now we have the automatic centrifugal pumping outfit, which no doubt will revolutionize mine pumping.

Large Volumes of Water Pumped

One of the greatest of mining problems is pumping. Water must be handled and rehandled in almost every mine whether in operation or idle. In the bituminous-coal field it is asserted that an average of about two tons of water is pumped from the mines per ton of coal mined, while in the anthracite field the ratio is about eleven tons of water to each ton of coal; in some places the figure runs as high as fifty tons of water per ton of coal. Obviously the investment in pumping apparatus is large and the importance of the pumping station is great.

In the opinion of many mine engineers the centrifugal pump has become the logical pumping unit for most large pumping problems and its automatic operation is very desirable. Strange as it may seem the development of the first automatic centrifugal pumping outfit was due to the failing of the human element in non-automatic operation.

The idea of developing an automatic centrifugal pumping outfit was first suggested in May, 1922, by J. T. Jennings, power engineer for the Philadelphia & Reading Coal & Iron Co., with offices at Pottsville, Pa. Realizing the usual difficulties which go with the operation of centrifugal pumps, he decided to set out to devise some means by which the centrifugal pump could be primed and started automatically. Collaborating with him were B. M. Horter, of the Cutler-Hammer Manufacturing Co.; Guy V. Woody, of the Allis-Chalmers Manufacturing Co., and Otto Haentjens, of the Barrett, Haentjens Co., of Hazleton, Pa.

Prior to this date, certain devices had been developed for priming centrifugal pumps by means of a vacuum pump and a vacuum breaker to prevent the flooding of water into the vacuum pump. It was around this equipment that the automatic features were built. After some preliminary development of ideas and plans Mr. Jennings purchased certain electrical auxiliary apparatus, a vacuum pump and vacuum breaker and put into operation what later became the first automatically primed, started and protected centrifugal pump. The installation was at the Draper mines and was put in operation last June.

Since that date many automatic centrifugal pumping outfits have been laid out and ordered and some are already in operation. The success of these first outfits seems to indicate clearly the great need and keen desire for automatic pumping stations.

Reasons for Automatic Pumping

It is interesting to trace the events which led up to the development and installation of this pumping station. The Philadelphia & Reading Coal & Iron Co. had recently decided to electrify its properties on a rather large scale, and was confronted with the problem of installing electrically driven plunger pumps or electrically driven centrifugal pumps to handle the large volume of water encountered in its mines.

The electrically driven centrifugal pump offered the ideal pumping unit for underground service, as it takes up little space, has a smaller initial cost and a lower operating cost.

For several years centrifugal pumps have been used as mine pumps in the anthracite field. The extended use of this type of pump, however, has been retarded by the seemingly inherent unreliability of the pump, which apparently is due to acidulous mine water acting on the vital parts of the pump in such a way as to destroy its efficiency in a relatively short time. This has resulted in high power costs, heavy repair bills and annoying shutdowns. The company had used centrifugal pumps as relay pumps since 1904, but had not considered this class of pump for its permanent plants.

Confronted with the problem of deciding between plunger pumps and centrifugal pumps, a comprehensive study was made of the several makes of centrifugal pumps and it was decided that the advancement made in designs justified the installation of a test plant of

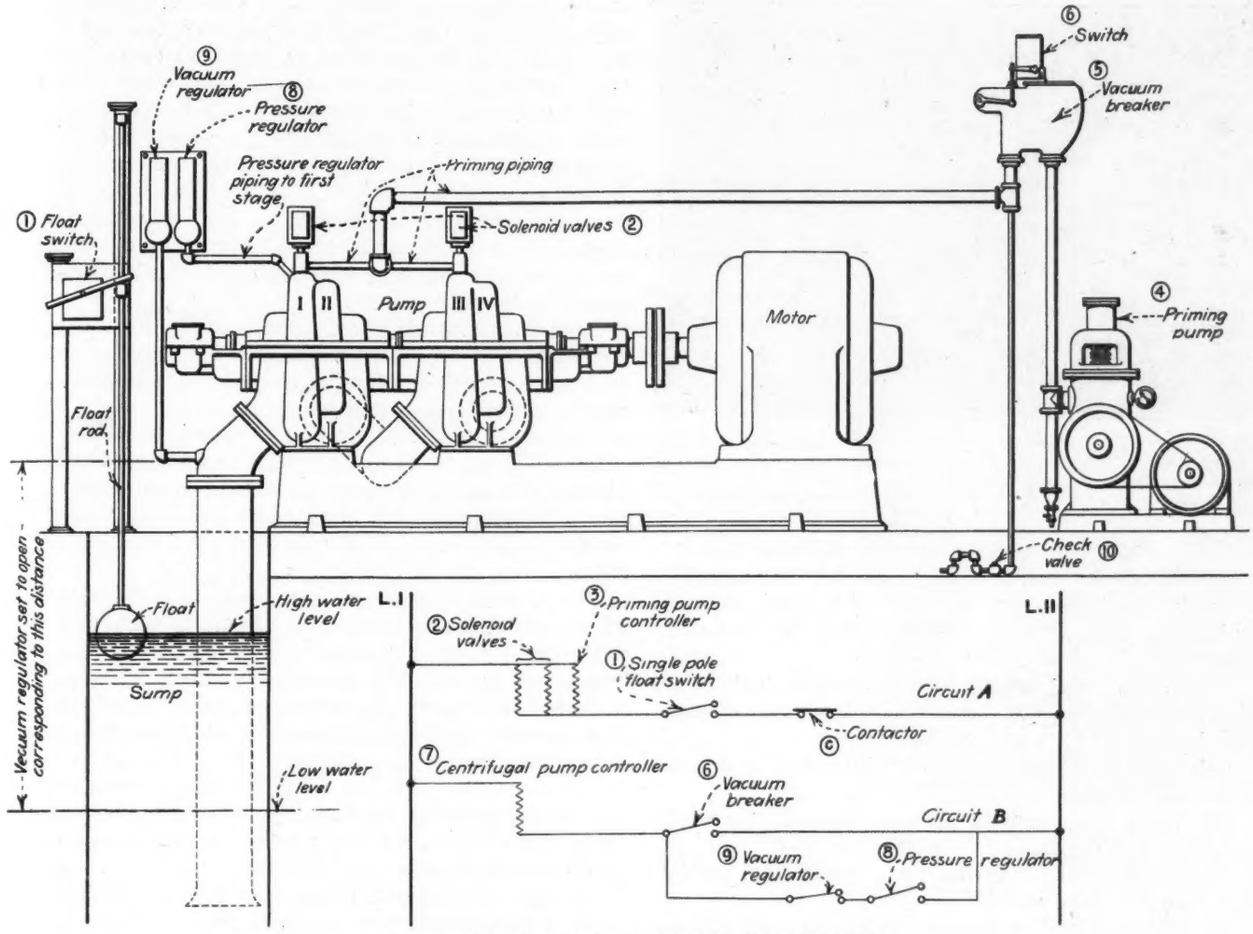


FIG. 1—PUMP LAYOUT AND CONTROL WIRING

The complete equipment is shown here, including the priming pump and control panels. The wiring diagram shows the starting and operating circuits with protective devices.

sufficient capacity to eliminate entirely one of the steam pumping plants. It was therefore decided that this test pumping plant be located at the Draper Colliery, in the Mahanoy Valley about 12 miles from Pottsville.

The pumping plant as originally installed comprised two six-stage centrifugal pumps having a combined capacity of 4,000 gal. per minute against a head of 650 ft., each pump driven by a 400-hp. 2,300-volt 900-r.p.m. slip-ring induction motor with automatic contactor control panel. When finally completed and put in operation the initial tests showed a pump efficiency of a little better than 75 per cent. For a few months this plant received close attention and no troubles whatever developed; but when close supervision was relaxed and the plant was placed under the sole care of the pumpmen, pump troubles began to develop, causing stoppages of the pumps for repairs.

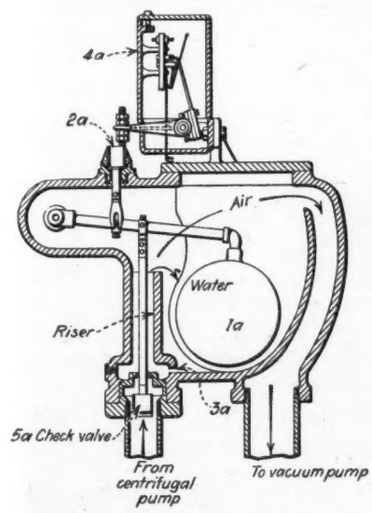


FIG. 2—VACUUM BREAKING DEVICE

This device is the most important piece of equipment in the automatic apparatus. It protects the vacuum pump and controls the starting of the centrifugal pump.

The Reading engineers became anxious over these stoppages and after a thorough investigation decided that many of the breakdowns were due in part at least to the operator's starting the pumps before they were properly primed and continuing the operation of the pumps after the sump was lowered. Realizing that any attempt to operate the pump not properly primed was disastrous to the pump, it was decided that to make a really successful centrifugal mine pumping plant, the several manual operations should be made automatic, thus eliminating the human element in the vital stages of operation.

A canvass of all the mining companies, however, disclosed the fact that no steps had been taken to make the operation of centrifugal pumps automatic; neither

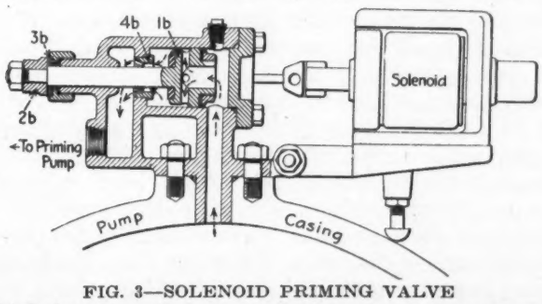


FIG. 3—SOLENOID PRIMING VALVE

This valve allows the pump to be primed and closes when the pump is started and ready to pump. Its action is very positive due to the pressure created inside the pump during operation.

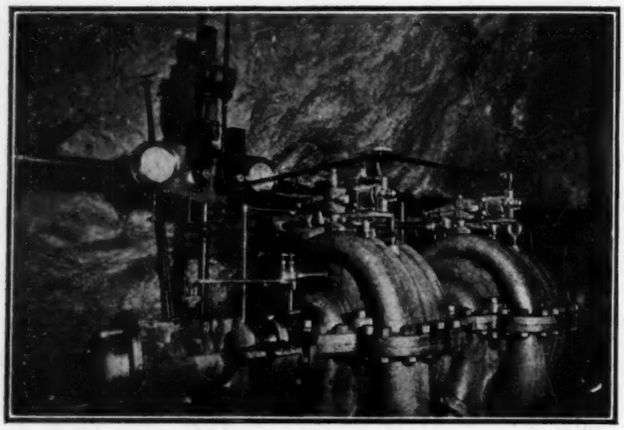


FIG. 4—FOUR-STAGE PUMP AND CONTROL
This pump is made up of two separable units; each unit is shown with its automatic priming valve. The vacuum breaker and float switch appear between the pressure and vacuum gages.

had any of the pump manufacturers anything to offer.

Guided by the desire to provide only the essential protection and operating features with a minimum of equipment, Mr. Jennings decided that the following conditions had to be met:

(1) Starting and priming the centrifugal pump when the water in the sump reached a predetermined high level.

(2) Protection against starting the centrifugal pump unless fully primed.

(3) When the pump is properly primed, the motor is started and the pump brought up to speed.

(4) Stopping the priming pump when the centrifugal pump is up to speed.

(5) Running the centrifugal pump through its protective devices.

(6) Stopping the centrifugal pump when the water in the sump recedes to a predetermined low level.

(7) Protection against running the centrifugal pump if it loses its water or if the column breaks.

With these points in view, development was carried on until the automatic pumping outfit took its present form, and additional plants have been installed by this company at the Kohinoor and Boston Run Collieries.

Fig. 1 shows the general layout and arrangement of the complete priming, pumping and control equipment. The cycle of operation is as follows:

When the sump was filled to a predetermined height, at which the pumping should start, the float closes switch 1, thereby closing circuit *A*, thus energizing the solenoid valves and closing priming pump switch 3. The solenoids open the priming valves and the priming pump 4 begins to run, drawing air out of the suction pipe and pump casings, through the priming piping, and into the vacuum breaker 5. The pump is thus primed by the water taken up from the sump.

Fig. 2 shows the vacuum breaker. Float 1*a* rises and closes switch 6, thereby closing circuit *B*, thus closing the centrifugal pump motor switch 7 and starting the centrifugal pump. As soon as the pump begins to run, water is forced through the priming valves 2 into the priming piping and vacuum breaker, causing float *1a* (Fig. 2) to rise further and open the air valve, *2a*. Air now enters the vacuum breaker, breaks the vacuum and the water drains out through the check valve 10, float *1a* falls and opens switch 6.

The centrifugal pump motor would now stop if the shunt around the switch were not provided. This shunt circuit contains a normally closed vacuum regulator, 9, and a normally open pressure regulator, 8. The pressure regulator is connected to the first or any other stage of the centrifugal pump and closes when the pressure approximates the normal pressure developed in the stage to which it is connected. This takes place soon after the motor is up to full speed. The vacuum breaker is so arranged that switch 6 is kept closed until this pressure regulator has closed, so that when switch 6 opens, the current passes through the vacuum regulator and pressure regulator which now controls the starter 7, as will be explained later.

In circuit *A*, contactor *C* is connected. This contactor opens and de-energizes the priming valve solenoids and opens switch 3, stopping the priming pump as soon as the centrifugal pump motor is up to speed. This contactor is actuated through a device on the motor shaft which opens when the motor is up to speed. When the centrifugal pump stops, contactor *C* again closes and the priming pump will start again providing the float switch, 1, is closed. This constitutes the starting operation.

The wiring diagram of Fig. 1 shows that by means of circuit *B* the motor-control circuit is such that the centrifugal pump will come to a stop when one of the regulators opens. The vacuum regulator, 9, is set for a degree of vacuum depending upon local conditions. If the vacuum regulator is used for stopping the pump when the sump is pumped down, the amount of vacuum is equal to the distance from low-water level to the connecting point of the regulator piping to the suction line. This is done when the sump extends over a large area necessitating a long, sloping suction line. If the sump can be arranged as shown in Fig. 1, which is the ideal arrangement, then a 2-pole sump switch can be used for stopping. In the latter case the vacuum regulator is set for a slightly higher value and acts only when the suction increases unduly, due to a blocked strainer.

The pressure regulator opens when the pressure fails. This may be caused when the inflow of water is restricted, due to a blocked strainer, a broken column line, or when air enters the pump through leaky joints in the suction line or through the stuffing box on the suction side of the pump. A small amount of air reduces the capacity of a centrifugal pump, because water entering the first impeller creates a mixture of expanded air and water. The air is compressed after passing through the first stage and therefore its presence is more easily detected in the first stage than in the fol-

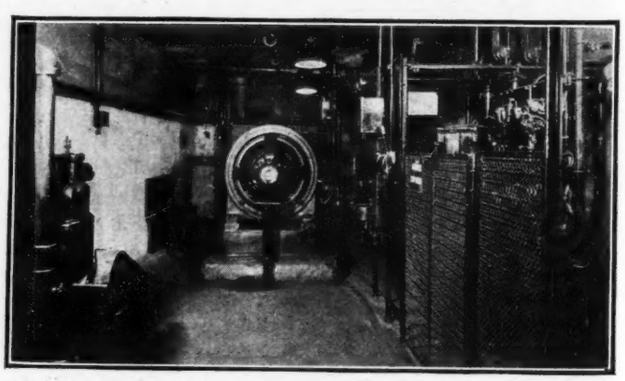


FIG. 5—MODERN PUMPING STATION AT KOHINOOR COLLIERY
This is how the latest type of mine pumping station looks. This station is fully equipped with automatic starting and control apparatus for both the pump and motor.

lowing stages. The pressure regulator should, therefore, be connected to the first stage. Actually it is taken off the priming valve connection to the pump.

From the above it obviously is necessary that one priming valve must be connected to the first stage, because if the first stage is not completely freed of air, the pump will not start. It is usual on this type of pump to provide one priming valve for two stage pumps, two valves for four stage pumps, three valves for six and more stages. The vacuum and pressure regulators are standard Cutler-Hammer equipment. The priming pump and vacuum breaker were originally designed for manual operation by the Barrett-Haentjens Co., of Hazleton, Pa., and were fully described in the March 30 issue of *Coal Age* in 1922.

For automatic operation the vacuum breaker has been slightly altered and is shown in Fig. 2. The water does not flow directly into the vacuum breaker housing but enters through a riser, the foot of which is pierced by a hole *3a*. The riser serves a double purpose. The water when entering is mixed with air and is therefore turbulent; and this would cause a jerky operation of the float. By coming out over the riser the air now goes directly to the vacuum pump and the water falls into the pocket, raising the float gently. The float, through lever *5a*, closes first the switch and then opens air valve *2a*, whereupon the water falls rapidly from the inlet side of the riser but slowly from the chamber, thus delaying the opening of switch *4a*, which must be kept closed until the centrifugal pump is well under way and has established the normal running pressure required to close the pressure regulator. Switch *4a* can be of the 2-pole type and would then stop the priming pump and de-energize the solenoids the instant the centrifugal pump starts up.

Should switch *4a* fail, water cannot be drawn into

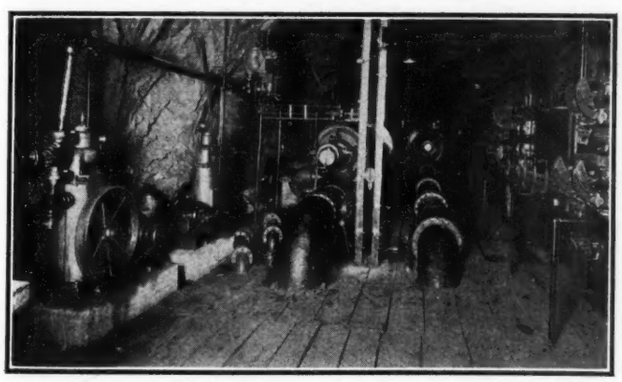


FIG. 6—DRAPER PUMPING PLANT, THE FIRST AUTOMATIC MINE PUMPING STATION

Due to the location and moisture the control and feeder wires in this station are run in conduits suspended from the roof. The vacuum priming pumps are shown on the left.

the priming pump, as air will enter through valve *2a*, breaking the vacuum. Should the priming valves stay open after the centrifugal pump has started and discharged more water into the priming piping than check valve 10 can pass, check-valve *5a* will finally come to its seat and prevent water from entering the priming pump.

The solenoid priming valves were especially designed for mine service, being made of cast acid-resisting bronze and having no small bolts. The valve as shown in Fig. 3 is open; the solenoid when energized pulls stem *1b* to the right until crosshead *2b* touches washer *3b*. The solenoid remains energized as long as the priming pump runs. The pull of the solenoid is supplemented by the atmospheric pressure, which tends to push stem *1a* to the right when there is a vacuum within the valve body. Preferably the valve is mounted directly on the pump casing. The air passes through small holes in the stem, as shown. The area of these holes is ample for air, but when the centrifugal pump starts up, water under pressure enters and cannot escape quickly enough through the small holes so that an excess pressure is built up on the right-hand side, which pushes the stem to the left until the leather-faced part of the stem touches seat *4b*. This makes a tight joint, which can also easily be renewed. The closing force therefore is great. A 1-in. valve has a 2½-in. plunger, so that the valve on the first stage is pushed closed with a pressure of several hundred pounds, depending on the pressure developed by the first stage. The valve, however, closes slowly as the pressure builds up, but is held closed with the full pressure and therefore stays tight.

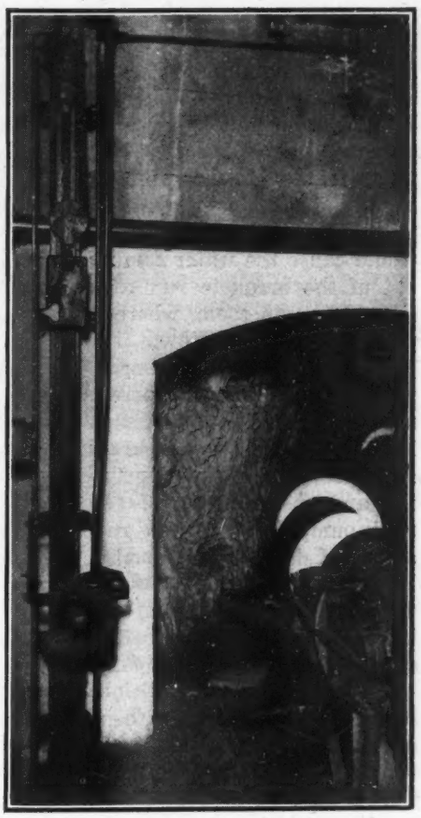


FIG. 7—WATER LEVEL INDICATOR

This indicator gives a visual indication of the amount of water in the sump. Control equipment on this indicator starts and stops the automatic pumping. Note the strainer with removable cover shown at the right of the picture.

When closed, the valve cannot open until the solenoid is energized. This is important when one priming pump serves a number of centrifugal pumps. Only the pump whose solenoids are energized is primed. The other valves of the other pumps, due to the vacuum in the priming piping, are pulled tight to their seats. One priming pump can serve a number of centrifugal pumps, but each centrifugal pump must have its individual sump float switch, vacuum breaker and regulators.

An interesting feature in connection with this equipment is that in case of any trouble the priming pump will operate to prime the centrifugal pump four times before shutting down and then locking out. This arrangement insures the starting of the pump in the event of some slight irregularity. Arrangement can be made for a bell alarm whenever the station is thus locked out.

The automatic pumping equipment performs many functions besides automatic priming and starting, although they are the major features. A complete outfit will prime and start the pump when the water in the sump reaches a predetermined height and stop the pump when the sump has been pumped down to a set level.

Should the suction line become blocked, the pump shuts down. If the suction line or pump leak air, the pump shuts down. When the column line breaks or has an excessive leak, the pump shuts down; this is highly desirable when the pump has a column line which would cause the water coming out of the break to run back into the pump room, where it probably would drown the pump out. It also is impossible for the pump to operate unless all conditions are such that the pump would operate satisfactorily. Improper priming and operation of centrifugal pump have been a real source of danger and expense. Frequently pumps have been wrecked and lost due to not being properly primed before starting or due to losing its water during operation.

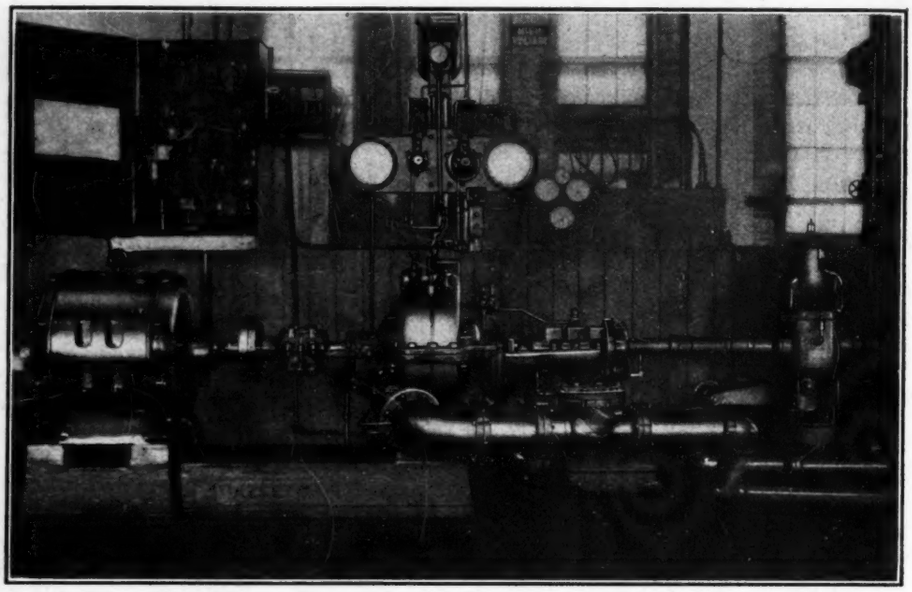


FIG. 8—COMPLETE EQUIPMENT FOR AUTOMATIC PUMPING STATION

There are several additional operating and economic advantages obtained with automatic pumping equipment. Pump runners often do not know to what level water in the sump should be pumped out and frequently the pumproom layout is such that they do not know the level of the water in the sump unless they go to some trouble to find out. The result is that the water in the sump is sometimes pumped so low that the pump rattles, causing excessive strains. At other times the sump may be allowed to fill up to an unsafe level. Both of these conditions are made almost impossible with the automatic features of operation.

Remote control of the pumping also is made possible. Frequently pumps must be placed in inconvenient places in order that the suction line can be made as short as possible, yet it usually is undesirable to place the control equipment where the pump is located. In this event it is entirely feasible to place most of the control and priming equipment in a higher and safer position where inspections and repairs can be accomplished under better conditions.

Cost for pump operators also has been an important item to the coal manager and especially is this true in the event of a temporary idleness of the mine, when it is desirable to keep fixed charges as low as possible. In the event of suspension, strike or shortage of labor, automatic pumping equipment makes possible the operation of a large number of pumps with only a small amount of occasional inspection. With automatic equipment one mechanic can keep a large number of pumps in perfect operating condition.

Seizure of Ruhr Mines May Bring About Crisis in French Fuel Supply

Business men are skeptical as to the outcome of the action of the French Government on July 29 in seizing cokeries and mines in the Ruhr for direct operation, says a cable to the Department of Commerce at Washington from Chester Lloyd, commercial attaché at Paris. Apprehension lest the supply of fuel from the Ruhr cease is increasing, and Strasbourg business interests are asking for the establishment of an emergency winter coal stock of 500,000 metric tons, complaining that little coal has been received from the Ruhr and that a coal crisis similar to that of 1920 threatens the district.

Basil Miles, Administrative Commissioner for the United States of the International Chamber of Commerce at Paris, in a report says that France is getting only about one-third as much coal and coke out of the Ruhr as she previously got from the regular reparations deliveries. The Ruhr, he says, may be regarded in many aspects as an industrial district on strike as the result of German passive resistance. Mr. Miles reviews economic results of the occupation and says that wherever the Germans refused co-operation the French proceeded without it and at the same time retaliated by measures established under martial law. Where the Germans refused to mine coal and make coke for the French, the French replied that they would not be allowed to make it for themselves, and an embargo was placed on the exportation of coal and coke, and on products of the metallurgical industry into unoccupied Germany.

As the German Government has refused to continue coal and coke deliveries since the occupation, the French are systematically seizing accumulated stocks, taking one mine or factory at a time. Practically every time they do so the workmen concerned strike and refuse to continue production for French consumption. Contrary to expectations, theoretically there is no unemployment in the Ruhr. Workmen are overhauling factories and opening new veins of coal, non-productive work which will be useful in the future.

With six months freedom from allied control, Mr. Miles says, the Ruhr probably could produce more coal than ever before; certainly within a year its present capacity could be organized to a production much in excess of any pre-war year. Mr. Miles says that the idea that the French themselves can produce Ruhr coal, coke and steel without German labor and management is fantastic.

The coal and coke so far removed from the Ruhr, according to advices from the Berlin correspondent of *Coal Age*, consists solely of the reserves accumulated during the earlier months of the occupation. Nothing has been added to them since the middle of April. The critical stage will be reached in September or October, when these reserves are exhausted with no new supply forthcoming. Allied shipments in July dropped to abut 5,000 tons of coal and 1,300 tons of coke per day, according to German observations. While at first only coke and high-grade coking coal were seized, coal of inferior quality is now being taken. The reserves in existence at the end of July were estimated at 1,000,000 tons, a large part of which is stored in localities difficult of access and consists in part of lean, soft grades unsuitable for coking.

Present Practice in the Design and Sinking of Shafts*

Ground Water Adequately Protects Most Timbered Shafts, and Preserves Them Also—Concrete Both Scales and Pockmarks—Should We Use Vitrified Brick?—Buntons of Concrete Not Resilient—Shall We Grout or Drain Shaft?

By R. G. Johnson†
Pittsburgh, Pa.

FIFTEEN years ago, only where the coal was less than 100 ft. below the surface did mining engineers think a slope the more desirable way of reaching it. In those days either a chain or rope hoist was used for moving the cars. Today rubber-belt and steel-apron conveyors are installed in slopes, and in consequence many prefer to drive a slope even when coal is found as much as 200 ft. below the surface.

The width of a shaft can be determined by the length of the car, always, however, making the width in excess of that length from bumper to bumper, to prevent the link from hitting the shaft lining when the cage is being hoisted or lowered. At least 4 in. of clearance should be allowed at the ends of the cages to provide for any irregularity in the concrete lining and for the possible accumulation of ice. Unfortunately, the hoist compartments must be either neutral or downcast, and for this reason they are cold in winter and likely to be filled with frozen water. In fixing the distance between the faces of the guides on which the cages slide the cagemaker's dimensions should govern. An allowance of about ⅛ in. for play should be made on each shoe of the cage.

In 1903 at South Brownsville, Pa., two shafts were sunk as concrete caissons, this method being made necessary by the fact that there, as well as on both sides of the Monongahela River in many of the stretches just above Brownsville, river silt overlies the rock. After sealing the caissons in the rock the shafts had to be sunk about 45 ft. to the coal, and this length was lined with concrete in place of the usual timber-set lining. These, as far as I can find, were the first shafts lined with concrete throughout. In 1903 at Gary, W. Va., two deeper shafts were constructed, elliptical in shape and lined entirely with concrete. Engineers generally were slow in accepting this new method of lining, but as time went on the value of the new designs impressed themselves on mining engineers, and today most of the new shafts are concrete-lined, and many that formerly were timbered have been lined with concrete when relining became necessary.

Though concrete provides a stronger lining, standard 8x10-in. timbers on 5-ft. centers with 2-in. lagging provide a lining amply stout, and with water rings which are catchbasins around the shaft just behind the lining and proper draining a timbered shaft can be made as dry as a concrete shaft. The question really resolves itself into a comparison of first and ultimate costs. The life of a first-class lining of white oak or long-leaf yellow pine, if the shaft is dry, will be from twelve to twenty years. If the shaft is wet, with water constantly dripping over the timbers, its life with minor repairs is almost unlimited.

If the field of coal being worked is so small as to give a life of twenty years or less, timbered shafts in most sections of the country will be cheaper than concrete even in the long run because the moisture that is found soaking into the timbers in most timbered shafts, especially around Pittsburgh, provides a good fire protection and acts effectively as a wood preservative. Only in exceptionally dry shafts is a timber lining dangerous. The timbers in some of the later installations have been treated with wood preservatives, but this is not advisable, for it would prove a splendid fuel for a fire. Because of the fire risk, timber linings are not permitted in new shafts by the state laws of Illinois.

After twenty years of watching developments in the design and construction of concrete-lined shafts, I am not sure they are entirely satisfactory. A large number of the downcast shafts which are lined with concrete are pockmarked. The lining is slowly scaling and disintegrating. Moisture or rain or dripping shaft water is sucked down with the incoming air and, of course, wets the surface of the lining. The concrete naturally absorbs some water and alternation of freezing and thawing eats into the lining, causing it to peel scale by scale. I am convinced that we must find a suitable waterproofing for downcast concrete-lined shafts, or we shall have to provide a veneer of some impervious nature. I believe vitrified brick would make an effective veneer, the brick to be laid in cement and locked every four or five courses to the concrete lining with a row of headers.

Of course, in constructing a plain concrete lining, it is possible with very careful puddling, while the concrete is being placed to remove most of the small air bubbles, and in some linings waterproofing compounds have been used, but the success of these waterproofings has been rather indifferent. This trouble with linings is today the most serious problem in shaft construction, closely akin as it is to the handling of the water through the lining.

A New York waterproofing concern has proposed a method of treatment for a shaft lining in the Pitts-

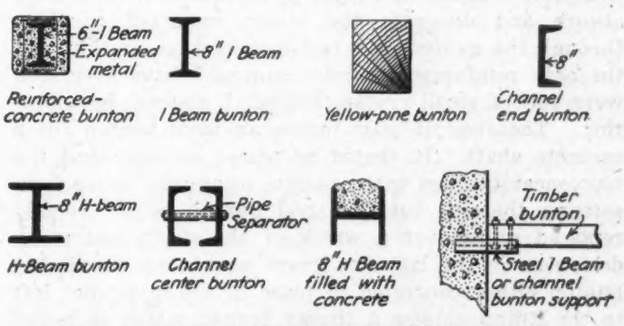


FIG. 1—VARIOUS TYPES OF SHAFT BUNTONS

A bunton should give a little when bumped or it will tend to break. If made of steel and shaped so as to collect water it will rust away rapidly unless the receptacle thus created is filled with concrete. It is well so to arrange the bunton that it can be removed without injury to the walls.

*Abstract of paper read before the Engineers' Society of Western Pennsylvania; from *Proceedings*, May, 1923, p. 134.

†President, R. G. Johnston Co.

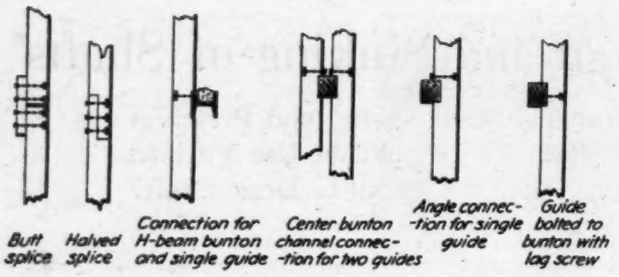

Butt splice
Halved splice
Connection for H-beam bunton and single guide
Center bunton channel connection for two guides
Angle connection for single guide
Guide bolted to bunton with lag screw

FIG. 2—METHODS OF SPLICING AND HOLDING GUIDES
The simplest and best of splices is the butt splice. The bolts should be countersunk into the guides so that the bolt heads will be at least a quarter of an inch below the exposed face.

burgh region which has scaled and become pockmarked by the action of water and ice, and the work, which I understand will start this spring, will certainly be watched with interest.

In England, France and Germany brick is used for most of the deep shafts that are masonry-lined, but engineers in this country have never strongly inclined toward either brick or concrete block. In a flat-sided shaft, brick or block will not give the desired strength where the strata are soft. Concrete fulfills all requirements of strength and will stand the unusually severe strains produced by the blasting which the sinking process makes necessary.

Pipes, drains, and bunton and guide connections can be placed in the lining as it is being constructed. The concrete should be mixed in the proportion of 1:2:4. It should be from 12 to 18 in. thick. Provision always is made, however, that points of solid rock may project within 4 or 6 in. of the concrete form. This unquestionably adds to the support of the shaft lining.

Concrete, then, will be the medium for the lining of the shafts we are designing, a vitrified veneer being used for the downcast compartment, which will be separated from the hoistways by vitrified-brick walls laid in panels on the buntons.

The function of the buntons in a concrete shaft is principally to hold the guides in position. Their strength is seldom calculated with the idea that they have to support or brace the lining except near the top of the shaft, where they help to prevent the bulging of the loose earth. This does not conform to the ideas of some designers, but experience has surely proved that the rock measures have no lateral movement when they are practically horizontal. Use has been made of many different sections of buntons. The material of which they are made may be wood, steel, or combinations of steel and concrete. With timber-set lining the bunton is a necessary part of the framework.

Timber buntons and steel buntons have resilience to absorb and dissipate the strain imparted to them through the guides by a fast-moving cage or skip, but the only reinforced-concrete buntons I have ever seen were full of small cracks, caused, I assume, by vibration. The steel H-beam makes an ideal bunton for a concrete shaft. It should be placed on edge and the top concavity filled with concrete to prevent water from settling therein, but the steel bunton is not readily replaced in case of a wreck of the shaft, and many designers in the last few years have used the timber bunton either concreted in place or set in hitches left in the lining or else a timber bunton which is bolted to short sections of I-beam or inverted channel concreted in.

The various types are shown in Fig. 1. The principal objection to steel is its susceptibility to corrosion in the combination of mine air and mine-water drippings, and, though it easily can be painted outside the shaft, nothing entirely effective can be done in the shaft on account of the dampness. The best paint for mine buntons is a homemade mixture of coal tar, portland cement and kerosene applied hot to the clean steel.

I know of one case where the buntons were painted with this combination ten years ago, yet recent investigation showed them to be in fine condition. Many believe steel buntons are best, but, being concreted in, they cannot be quickly replaced, and many enginers incline toward the timber bunton bolted to short steel I-beams concreted in the lining. Where a masonry partition wall is built in the shaft, steel buntons, are, of course, best.

Guides for the cages are practically always of timber, a prime grade of long-leaf yellow pine being the most desirable. Steel has been tried, but I know of no successful safety device that will work on steel guides to guard the cage from falling in case of accident. Set accurately to plumb-line and gage, the guides are dapped over the buntons and bolted to them. There are several methods of splicing the guides, and the simplest and best of these is undoubtedly the butt splice. All bolts are countersunk into the guides, and the heads of the bolts should be set in at least ¼ in. deeper than the face of the guides (see Fig. 2).

Partitions in timbered shafts are of yellow-pine tongued-and-grooved sheeting either of two layers of 1-in. tongued-and-grooved material spiked with loose joints to the buntons, or of one layer of 1½-in. tongued-and-grooved sheeting. Partition walls, or curtain walls, as they are often called, in concrete-lined shafts are nearly always of reinforced concrete, and though some have been constructed as a continuous solid concrete wall from top to bottom, a thinner and stronger wall can be constructed on steel buntons placed at intervals of 5 or 6 ft. in the shaft.

Advocates Vitrified Brick for Shaft Walls

The walls usually are reinforced, and a typical design is shown in Fig. 3, but some of the concrete walls in downcast shafts have peeled and are constantly scaling. I believe that they too should be made of vitrified brick. The light reinforcement that is now used in concrete walls can be used just as well in the brick wall. Laid in cement mortar with thin joints, they should serve their purpose well.

I favor vitrified brick simply because it is the best medium that I know which presents an impervious face. If we can find a waterproof paint that can be applied so that it will be absorbed into the pores of the face of the concrete or a waterproof plaster that will cling to the lining and will stand the test of time in its resistance to the water, our problem is solved, and concrete so treated will be ideal.

The method of handling water which is encountered in the sinking depends largely upon the quantity of water and the nature of the rock. Grouting is the only method of preventing the water from coming into the shaft, and today provision for the sealing of water by injecting cement into the fissures of the water-bearing strata is a part of all specifications.

Today all prices in contracts for sinking shafts are based on the assumption that if water is encountered it will be kept back by grouting and the work paid for according to provisions made in the contract. Grouting usually is paid for per barrel of cement

injected, but it would seem that a method fairer to both parties would be an agreement to pay for the cost of grouting on a basis of cost plus a fee per barrel, the fee to include the use of the contractor's plant and his profit.

The grouting clause and its price today takes the place of the water clause in the contracts of twelve and fifteen years ago. This clause in former contracts provided for additional prices per vertical foot sunk in case certain quantities of water were struck, the prices to increase as the quantity augmented, but this was an inequitable manner of paying for the cost. On one job I saw the contractor lose everything he had because he could not get below the water, the rock being blocky and full of fissures, so that he could make no footage at all in sinking and consequently could earn no premium to pay for the cost of his constant pumping.

On another job a contractor was able to construct a water ring just below the water stratum, which was reasonably close to the top of the shaft, and, placing his pumping plant at this ring, he pumped on, the pumping having no effect on his sinking, which was practically dry. According to the water clause, he was paid, of course, by the foot sunk for the additional water, and he sunk well and his coffers were filled with gold, and there was joy in the house of the contractor.

The fairest water clause for pumping is the one based on paying by the million-foot-gallons for all water pumped. This form of water clause (in addition to the clause for grouting) was used in the contracts for the shafts and tunnels for the Catskill aqueduct, which was completed several years ago. A typical water ring is shown in Fig. 4.

High-Pressure Grouting in Solid Rock

The pressure used in grouting varies greatly according to conditions. If you are grouting in solid rock, the higher the pressure the more efficient will be the grouting. Usually with a grout tank you will use up to 125 lb. pressure. If you are using a pump, the pressure available is limited, of course, by the steam pressure and the ratio of the cylinders on the pump. In several cases on the Catskill aqueduct grouting was done under pressures as high as 500 lb., and my recollection is that in one or two cases a pressure of 600 lb. was used through the use of special equipment. Little high-pressure work is done in this section.

In grouting behind a shaft lining special care must be taken to gage the pressure properly, and definite results can never be guaranteed. If the holes to be grouted are in a round shaft, or in the round ends of a long shaft, they will, of course, stand more air pressure than in the flat side of a shaft, but it is practically impossible to force grout behind a lining with less than 20 lb. of air, and the possibilities of breaking a flat lining under even 20 lb. of air are great.

When grouting behind linings was first started, pans or blisters of tin usually were put against the rock rib where the water ran out when the lining was being poured, and a hole was punched in the tin from which a pipe led to the concrete lining form, and the grout was forced through this pipe. This is still done in many cases, but if it is possible to drive a pipe into the water-bearing crevice and calk the rock seam so that all water will lead into the pipe, a much better grouting job can be done, for higher pressures can be used, as there is not the area of lining over which the pressure of the grout can act.

The most successful grouting job in mine-shaft sinking was done near Welch, W. Va., on the Tug River. Here a shaft that had been sunk for ten years was still making 750 gal. of water per minute. When the mine changed hands improvements were planned and it was proposed that the shaft be lined with concrete, the lining to be designed so as to withstand pressure sufficient to grout the flow of water. We designed a heavy reinforced lining and used an unusually heavy H-beam section for the buntons, which were figured as struts.

Back of the lining we placed corrugated iron, and canvas back of this, our idea being that when the grout was forced behind the lining it would fill the pores of the canvas and absolutely insure a watertight job. When the grouting was finished, the shaft made, as nearly as we could figure, one quart of water per minute. I may add that the success of this job is

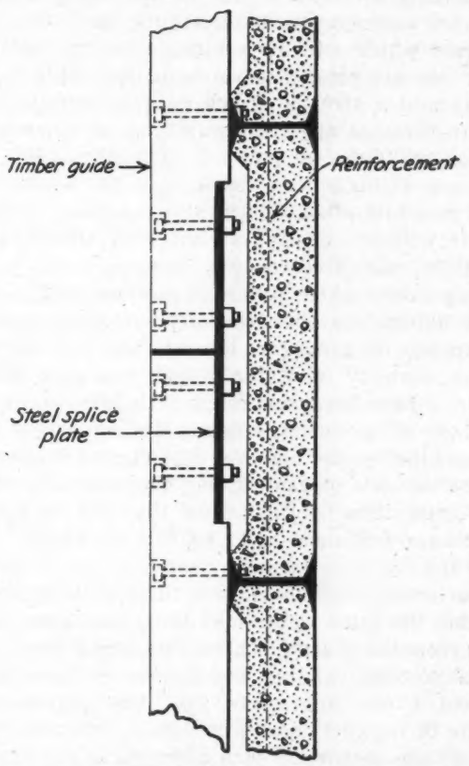


FIG. 3—SHAFT CURTAIN WALL
Illustration shows buntons with concrete in panels, a butt guide splice and the connection between the buntons and guides.

extremely unusual. Many equally heavy streams are encountered nowadays, but they are grouted in the sinking, and the necessity for heavy linings is avoided.

Grouting in slopes is more difficult. As the strata usually are horizontal, the grout injected into the crevices must travel over a large area to be effective. In water-bearing country it is wise to keep a test hole ahead pointed downward at a greater angle than the angle of the slope. If water is struck, more holes are drilled and grouted to refusal, but in driving a slope through a horizontal water-bearing crevice it requires a long horizontal distance to get beyond the drainage area of that crevice. In consequence the sealing of water from a single crevice often requires several grouting operations. Each operation requires not only the time for the injecting of the grout but a longer time to allow it to set before again shooting the face.

With the coal operator who is not familiar with the process of grouting the question of cost naturally arises

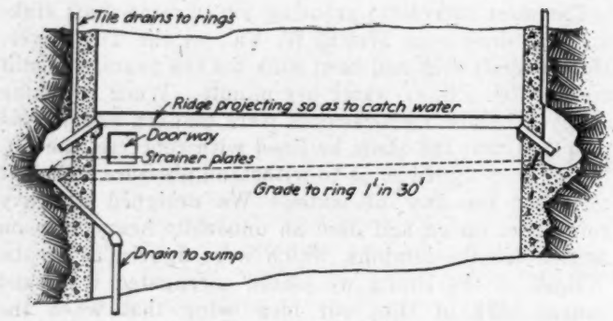


FIG. 4—TYPICAL RING IN CONCRETE-LINED SHAFTS
What little water is permitted to escape into a grouted shaft is caught by a protecting ridge and carried back to a shaft ring through pipes. This ring collects the water to a low point and is drained by a pipe to the sump.

when letting a contract. He is, of course, anxious to cut down the cost of his pumping, and any process or device which will save him dollars is interesting. Let us take a typical case. Assume the shaft to be 400 ft. deep and a stream of 200 gal. per minute encountered in the sinking. If this stream is not sealed the operator will have to pump it throughout the life of the mine. If his power averages 1c. per kilowatt-hour, it will cost him about $3,000 a year. On a 15-per-cent basis it will be found that he could afford to spend $20,000 to seal off the water.

Though the rock in different sections of the country largely determines the grouting conditions, and hence the expense of grouting, the average cost of sealing off this quantity of water would run over $3,000 or $4,000. I have been connected with jobs on which the total cost of grouting streams far in excess of 200 gal. per minute was not over $2,000, and I know of no work on which a stream of this quantity has cost more than $5,000. The operator could thus pay for his grouting in a year and save $3,000 or $4,000 a year afterward.

Some engineers believe that in the development of the mine the same water may be caught that has been sealed from the shafts. There are cases where I believe this is possible, and if the stream is directly above the coal I can appreciate that the engineer might hesitate to instruct the contractor to grout the fissures, although the absence of such a stream in the shaft, even though it should come out later in the mine, would be of much advantage to the shaft bottom.

If the water is above a substantial streak of fireclay or a thin bed of coal above the one being worked, I do not believe there is much likelihood that water will penetrate the strata above the coal and flow into the mine; at least until the pillars are drawn and the roof measures have sagged or fallen. Water usually flows in underground streams rather than lying in huge pools. It is seldom possible to pump dry a stream encountered in sinking. I am familiar with only one case where this was possible.

I have not discussed airshafts as such, for the general details are, of course, the same as in hoisting shafts. Stairs, if such are installed, are either of steel or wood. Steel makes the cleanest looking and strongest job, but a steel stairway is exceedingly difficult to paint effectively in the shaft. Yet of all details a stairway from a mine should be fireproof.

For lining purposes the contractor will carry 40 or 50 vertical feet of concrete forms, which usually are made in sections. When it is decided to concrete, the muck is leveled off in the bottom of the shaft and sections of forms, designed according to the plan of the shaft and usually 5 or 6 ft. in height, are bolted together to make a complete ring. The bunton ends or buntons are placed in notches set in the forms, and the space betwen the rock rib and the form is filled with concrete.

This process is repeated until the stretch of concrete is joined to the old concrete above. As soon as the stretch of concrete is completed, the muck in the bottom of the shaft is taken out and the concrete forms are removed, and the process of sinking is again resumed. That blasting so soon after concrete is placed does not shatter the concrete seems remarkable, but I have never seen cracks from this cause.

No discussion of shaft design and sinking can be closed without saying a few words as to slopes, for in the last few years and at the present time they are being favorably considered for coal under 200 ft. in depth both for haulage and for manways. Conveyors both of the rubber-belt and steel-apron type have been successful in moving big tonnages at a low cost. For rubber belts a slope with a maximum of 33 deg. has been used, but I have heard users of the 30-deg. slope say that they are too steep.

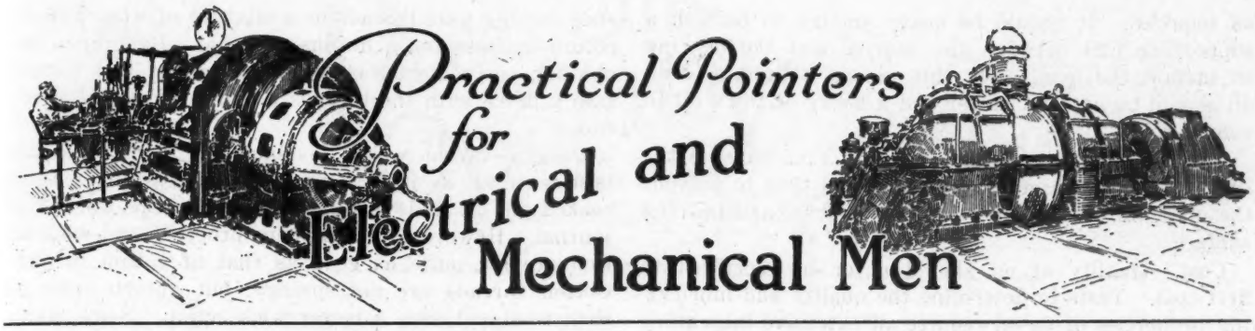
Slopes for manways and supplies usually are sunk on a 25-per-cent gradient. Slope linings of concrete depend upon the span of the roof for their design. Openings over 15 or 16 ft. wide are expensive to construct in localities where there is soft rock or an unusual depth of earth over the rock. Any slope is difficult to sink in soft earth and, as has been noted, is extravagantly expensive in running ground. In ordinary earth it costs about twice as much per lineal foot to sink as in solid rock because the earth is more difficult to remove than blasted rock, and timbering with sets closely spaced is required to prevent the roof and sides from caving.

In order to overcome the difficult construction of a wide slope in localities where there is excessive earth or soft rock, two companies in the Pittsburgh field have constructed double-deck slopes. Though expensive to build, one such slope is cheaper than two slopes having the same capacity or than one slope of the same area with the compartments side by side. Practically all concrete-lined slopes today have arched roofs from 12 to 18 in. thick. The thickness of the side walls should be 12 to 15 in. Arched slopes are naturally the strongest and do not as a rule require reinforcement. The additional area afforded by the arched roof always is to be desired for ventilation and headroom.

What Next?

Troutville, a mining town in Clearfield County, Pennsylvania, it is reported, is destined to become as famous for ice mining as it once was as a coal-producing center. With the discovery of a second "ice mine" reported in the state on a farm near the town, this form of mining is expected soon to assume the proportions of an industry. This natural refrigerating plant is in an abandoned coal pit on the farm of G. N. Rishell.

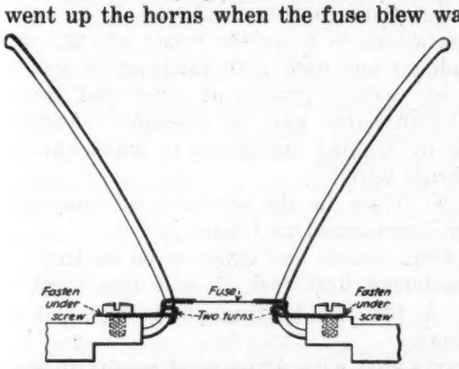
Cold air seeping in during the winter cools the rocks to a temperature far below the freezing point, but no ice forms because the air is too dry. In summer, however, the whole shaft becomes moist and when coal was being mined there recently miners had to remove two to three car loads of ice every morning before they could get at their work. This caused the shaft to be abandoned as a coal mine, thus opening the way for a brand new industry.



Protecting Attachment Screws When Severe Arc Goes Up the Horns

SOME time ago I noticed in one of your issues a suggestion for preventing the attachment screws from burning when the fuse of a horn-gap fused switch opened a circuit under heavy load.

I recently tried out this idea with success. On the switch that I tried this method of attaching the fuse, we had a heavy ground last month and the arc that went up the horns when the fuse blew was most severe. The attachment screws were untouched and a new fuse was easily placed in the circuit. In line with this same suggestion I wish to make mention of an idea which may possibly help still further. On a horn-gap fused switch which I recently fused, I doubled the fuse wire except at that part between the two horns where the fuse should open. Doubling the fuse wire in this manner, I believe, will cause the wire positively to melt between the horns instead of back by the screws, which sometimes is the case, especially if the fuse wire becomes nicked in attaching to the fuse switch.



DOUBLE FUSE EXCEPT AT MIDDLE

The fuse is caused to rupture in the middle by doubling the fuse wire where it goes around the horn and is attached to the screws.

A READER IN KENTUCKY.

Considerations in Laying Out a Belt Drive

A BELT drive is used to carry a certain amount of power from one revolving pulley to another. Sometimes there is an additional purpose and that is to reverse the direction of rotation. However, the first problem that confronts the belt user is to determine the kind and size of belt to use in order to obtain the most desirable results.

The amount of power transmitted will depend on several factors, among which are the velocity at which the belt travels, the tension under which it is placed on the pulley and the arc of contact which the belt has with both pulleys.

Several different types of belts are obtainable, all of which have considerable merit under certain conditions. Some are more adaptable to certain conditions than others, and therefore considerable care should be exercised in making the proper choice. In order to make an intelligent decision on any belting problem certain essential facts must be considered.

In many cases it is advisable to supply the manufacturers from whom belting is purchased with complete details and allow them to advise from their viewpoint of greater and more practical experience. For this purpose the following information should be given in order that a thoroughly accurate decision may be made: (1) Horsepower to be transmitted: (*a*) average; (*b*) least; (*c*) most. (2) Diameter of driving pulley. (3) Diameter of driven pulley. (4) Number of revolutions per minute made by one of them; state which one. (5) Distance between pulley centers. (6) Whether drive is vertical or horizontal. (7) Whether the tight side runs on top or underneath. (8) Operating conditions such as dampness, fumes, flying grit, changes from light to heavy loads; high speed over small pulleys; running at ¼ twist; use of idlers, mule pulleys and stepped or flanged pulleys.

Certain types and sizes of belts have been proved thoroughly satisfactory and are known to be standard for many uses. Therefore it often is possible for men familiar with belting problems to state accurately what is the proper belt to use based on requirements of horsepower, uses, size of pulley and working conditions. Sometimes it is found that differences of opinion exist among manufacturers. In many cases this is due to the possibility of interchange of types. The best guide as to the type of belt to be used, however, will be founded upon a knowledge of good usage, cost per year and working conditions.

Lubricants for Electrical Equipment

HOT bearings are due to a large extent to poor lubrication or to an inferior grade of lubricant. The fundamentals of correct lubrication are the use of the right lubricant, applied in the right way, and in the right amount. The amount and application of lubricant depend largely upon the design of the bearing and the service conditions.

OIL.—*Grade.*—Oils are either animal, vegetable or mineral. For mining haulage equipment use a good grade of neutral mineral oil. It must be free from acid or alkali, either of which will corrode the bright surface of the metal.

Purity.—The oil should be free from dirt and water. Water will reduce the lubricating value of the oil, as it tends to wipe the oil from the bearing. Particles of dirt and grit will increase the friction and cause the bearings to heat up.

Fluidity.—The oil should flow readily and be taken up by the waste and held. If it is too thin, the waste and bearing will rapidly drain the oil, and the bearing will soon run dry. Therefore the oil must have enough body to cling to the waste and be fed to the bearings

as required. It should be heavy enough to furnish a supporting film between the journal and the bearing to sustain the load. For this reason a light or thin oil should be used in winter and a heavy or thick oil in summer.

The oil should not gum, as it will then clog up the lifting or wick action of the waste and tend to prevent the oil from entering between the journal and bearing surface.

Cost.—Quality of oil should never be sacrificed to first cost. Tests to determine the quality and lubricating properties of an oil require an extensive laboratory equipment; therefore one should always deal with reliable producers who have had years of experience and testing facilities which enable them to guarantee the uniformity and reliability of their product.

SPECIAL LUBRICANTS.—Specially prepared lubricants which are not entirely oils are used by some companies with very good results, and are highly recommended.

GREASE.—*Uses.*—Grease is used in connection with the lubrication of some of the old type haulage motor bearings and on all main motor gears and pinions. The same grade of grease selected for motor bearings can be used for the gears and pinions, but some special grades and compounds prepared for gears and pinions are not suitable for motor bearings, on account of their high melting point.

Grades.—Grease consists of a fatty soap impregnated with a mineral oil. The solid part simply acts as a carrier for holding the oil in position, and has little value as a lubricant. Greases usually are graded according to their stiffness, which has an important bearing upon the ease with which they can be handled and the service they will give. They are mostly graded from the softest to the hardest with numbers indicating their relative melting point. Thus a No. 1 grease usually is softer than a No. 2 grease, etc. A limesoap grease with a neutral reaction (which does not show any traces of an acid or an alkali) gives best results in service.

Purity.—The grease should be free from dirt and grit and the percentage of water should be very low, as all of these would reduce the lubricating value and increase the heating of the bearing.

Melting Point.—To insure its being retained in the bearing, the grease should have a melting point of 10 to 15 deg. C. above the normal operating temperature. If it is too hard it will not flow readily and will increase bearing losses. On the other hand if the melting point is too low it will not be retained in the bearing.

Cost.—The same consideration referred to in connection with oil also applies to grease. In general, do not be misled by a highly colored or scented product with a fancy name and a correspondingly high price.

WASTE.—*Grades.*—Waste or packing is commonly made up of wool threads alone, or wool and cotton threads mixed with a resilient mineral or fiber, such as asbestos, cocoa fiber, moss, etc.

Dirt and Moisture.—Dirty particles are likely to be carried by the oil up to the bearing and work into the oil film. All waste contains some moisture, but if too much is present, you pay for water instead of waste.

Elasticity.—Unless the waste is springy and elastic it will fall away from the bearing window and thus cut off the supply of oil being fed to the journal. To obtain this quality it must be of the right grade of material, such as long wool threads or a mixture of wool threads, cotton threads and a fibrous material. By proper machining, the material is intimately mixed and formed into a fleece with the threads all running in one direction.

Quality.—Wool waste is commonly considered the best material as it is springy and elastic after being soaked in oil and readily parts with the oil to the journal. However, its absorbent property and wick action are not quite as good as that of cotton threads. Cotton threads are not springy, but absorb more oil than wool and have a better wick action. Some manufacturers consider that a mixture of wool and cotton threads gives best results in service. A good packing should have the power of holding the correct quantity of oil evenly distributed through the threads of the waste, which also should be able to carry the oil by wick action against the force of gravity, if necessary, to the threads in contact with the journal.

Long fibers are preferable as they carry the oil from the oil well to the bearing windows more satisfactorily than short strands, thus insuring a steady supply of oil. This is made possible by the wick action of the material when in a long continuous thread.

Special preparations to make the waste springy and elastic are made up and used with fairly good results. They consist of various grades of wool and cotton thread mixed with horse hair or asbestos. Another brand is made by binding the waste in small bundles using a thin brass wire.

Good rules to follow in the selection of lubricants may be briefly summarized as follows:

(1) Trade with reliable and experienced dealers.

(2) In considering first cost, do not lose sight of final results. A few hot bearings may wipe out all first-cost savings.

(3) Lubricants that have given good results in service need no further recommendation.

(4) Neglect frequently is responsible for troubles charged up against oil, grease and waste.

(5) Proper facilities for handling and storage should be provided.

Many large companies find it to their advantage to make a contract with some reputable oil company for all lubricants used during the contract period. In this event the proper lubricant for each piece of machinery can easily be determined and used for long periods without continual experimentation, with resultant inconveniences and expense.

Prefers Sandpaper to Emery Cloth For Cleaning Commutators

WITH reference to the article on "How Best to Undercut Commutators of D.C. Armatures," which appeared in the Aug. 23 issue of *Coal Age*, I wish to suggest that the statement, "After slotting is completed the face of the commutator should be thoroughly polished and cleaned of all particles of copper by means of emery cloth" be changed to "by means of sandpaper."

My experience has been that sandpaper is the better for this purpose. I have had pump runners, machine runners and motormen use both emery cloth and sandpaper but by discontinuing the emery cloth and using sandpaper entirely, much of the luminous or fiery commutation of the machines was eliminated.

Linton, Ind. JOHN R. LUXTON.

Problems of Operating Men

Edited by James T. Beard

Working Three Seams of Coal with Slate and Shale Partings

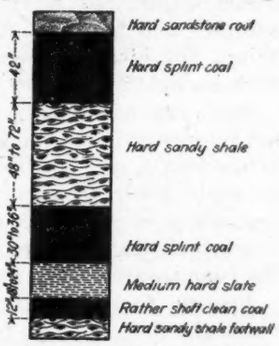
Use Longwall Method—Drive Roads in Middle Seam—Lift Floor and Bottom Coal Advancing—Drop Roof Shale and Work Upper Seam Retreating

IN RESPONSE to the request for criticism and suggestions regarding the proposed method of working three seams of coal separated by slate and shale partings, offered by a correspondent in *Coal Age*, Aug. 9, p. 219, I gladly submit the following outline, as the result of my experience when working under similar conditions.

The correspondent does not state whether the seams are flat or pitching, but I will assume the former condition. In the first place, allow me to suggest that the three seams described cannot, in my opinion, be worked successfully by the room-and-pillar method as proposed. Also, I believe the seams are too thin to consider driving rooms from 60 to 90 ft. in width.

Hard Coal More Easily Worked Longwall

Again, as indicated in the accompanying figure, the two upper seams are described as being "hard splint coal," which would be difficult to shoot and should be more readily mined in the longwall method of working. Whatever method is adopted, however, it will be necessary to brush all roads for headroom, and the longwall method affords ample storage space for the resulting waste material, which is not the case in the room-and-pillar method of working.



VERTICAL SECTION SHOWING THE THREE SEAMS

The correspondent proposes drawing back the pillars between the rooms by splitting each pillar with a 20-ft. room. In doing so, the roads would have to be brushed as before, making a large amount of extra work, to say nothing of the disadvantage growing out of shooting the hard coal. It cannot be denied that the longwall method of mining not only produces a larger percentage of big coal and a greater output per man per day, but the proposition of ventilating the working face is much easier than in room-and-pillar work.

Briefly, I would open the mine, as our friend has suggested, in the middle seam. I would employ the longwall advancing method, driving the main and branch levels in the middle seam, at the same time lifting the bottom parting and the twelve inches of coal in the seam below, for a width of 12 ft., which would give ample room for any kind of haulage desired. The waste material should be built on each side of the road.

The branch levels should be driven to the right and left of the main level, at distances of 250 ft. apart. These branch levels will cut off the longwall faces as they are advanced and so concentrate haulage and save traffic. It may be better to drive the branch levels but 10 ft. wide, brushing them in the same manner as the main levels. This will be best determined by the space found to be required for building the waste along each side of the road.

Upper Coal Taken Out Retreating

All working places should be driven 8 ft. wide, on 40-ft. centers, which will generally provide material enough for building the necessary packwalls. The working places are driven parallel to the main level and, as each place is cut off by the 250-ft. branch level, the work of taking down the roof shale and extracting the upper coal can be started back on the retreating plan.

It may chance that too much gas will be given off to make this plan practicable. In that case, the work of extracting the upper coal must be started, back at the mouth of the place, and conducted on the advancing plan, shooting down the rock and leveling it off sufficiently to lay track on which to load out the top coal. Part of this rock can be used to build packwalls for the support of the roof overlying the top seam.

It seems to me that the longwall method is the only method to adopt in working these three seams. Driving the gateroads 8 ft. wide, on 40-ft. centers, leaves but 16 ft. on each side of the road as the distance through which the coal must be handled at the face.

Another Plan of Working the Top Coal

It is possible that the top coal can be worked out on the longwall retreating plan, by brushing a hole 6 ft. square in the middle parting, every 30 ft., and throwing the coal down through these holes into cars standing on the roadway below. If it is found that this can be done there will be a considerable saving effected in the cost of brushing and handling the waste material.

Another plan would be to start back at the same point as in the first working and shoot down the four to six feet of roof shale, and level it off so as to lay the track on this débris. This will enable the working out of the upper seam on the longwall retreating plan, as the seam has a good roof.

My belief is that it will generally prove more practicable to mine the upper seam through holes driven up in the roof of the middle seam, as just mentioned; or else to adopt the advancing plan of dropping the shale parting and carrying the track on top of that waste, while loading out the upper coal. I believe that the

output, per man per day, would be greater and a larger percentage of round coal produced than by any other plan. JAMES GRAY.

Newcastle, Wash.

REFERRING to the question of working three seams of coal with slate and shale partings, contained in the inquiry that appeared in *Coal Age*, Aug. 9, p. 219, and the request for any criticism of the proposed plan and suggestions as to the best method of working to obtain a high percentage of production, per man per day, and to get out the coal in as large size as possible, let me say there are several objections to the proposed method.

First, in driving the rooms 90 ft. wide and laying three tracks in each room, there will be a large proportion of the waste rock that must be taken outside of the mine as the rooms cannot gob themselves in this arrangement. Second, where there is so large a quantity of waste to handle there will be much difficulty in keeping the coal clean. It will require close supervision of the miners and the enforcement of strict regulations in regard to the loading of dirty coal.

However, assuming that it is possible to overcome these two objections, there is yet imminent danger of squeeze resulting from driving 90-ft. rooms with 50-ft. pillars between them. A little reflection will show that such a plan is not practicable in this case. For example, the total span of roof resting on a pillar 50 ft. wide, flanked with 90-ft. rooms, is 230 ft., from rib to rib. Then when this pillar is split by a 20-ft. room the two 15-ft. ribs of coal remaining will be crushed and lost beyond recovery.

DIFFICULTY MET IN LOADING CLEAN COAL

In my experience I have seen coal mined under similar conditions in respect to the large proportion of waste material that had to be handled. As far as the work in the rooms was concerned, much time and patience was consumed in keeping the coal clean and loading it in a condition fit for the market. In pillar-work, however, to load clean coal was a practical impossibility, although the partings of slate were not more than 2 ft. thick in that case.

My conclusion is that the three seams mentioned cannot be worked in a single face. I would say, forget the lower and middle seams and go after the upper one, adopting a method of working that promises the best results. To my mind the longwall method is preferably the one that should be chosen in this case. It must be a gateway system, however, as the roof is too strong here to make a conveyor system successful.

Even a room-and-pillar system might be successfully employed in working out the coal in this upper seam. But, under no consideration, should 90-ft. rooms be driven. The width of the rooms should not exceed 30 ft. and a road should be laid along each rib, making the distance for handling the coal at the face less than 15 ft. The pillars between the rooms should have an equal width of at least 30 ft. and as much more as conditions may require.

Care must be taken to extract all the coal and no stump must be left in as that would cause trouble in working the two lower seams. The plan that I have suggested may seem strange to many, but it is my opinion that it would prove the surest method of securing the best results, in the working of these three seams, and I recommend its careful consideration.

In a mine where I worked, in Durham County, England, the coal was 12 ft. thick. Owing to the bottom 4 ft. of the seam containing many impurities, the company mined only the upper 8 ft. of the coal. Later, a new company came into possession of the mine and took out the remaining 4 ft. of bottom coal, finding that it could be made saleable.

My conclusion is that, in the present case, after working out the coal in the upper seam, there would not be any difficulty in working the two lower seams. It is my belief that a lot of trouble and expense will be saved by avoiding the experiment of trying to work the three seams in one operation. THOMAS HOGARTH.

Indiana, Pa.

Mine Safety Bulletins

Getting the miner interested in his own safety—Follows line of least resistance—"Rules made to be broken," the logic of some miners—Insistance on obedience to rules important.

I HAVE BEEN reading the excellent letter of F. C. Cornet, *Coal Age*, Aug. 9, p. 218, in which he strongly urges the need of both operators and miners obeying the spirit of the law and not the letter only. He calls attention to the fact that operators often deceive themselves into thinking that they have performed their duty to the men they employ when they have placed a few safety bulletins and danger signs to warn the unwary miner of his danger.

It is a characteristic of a large class of miners that they are not deeply interested in anything in particular. It may be that this is, in a measure, the result of their daily occupation in the bowels of the earth. However, for that reason, we cannot expect the average miner to become enthusiastic about many things that should appeal to his common sense.

To expect a miner to read elaborate rules and circulars, explaining safer practices in the mine, more sanitary and healthful modes of living and other like things for his betterment, is more than one familiar with his habits will expect.

Some one has remarked that "the average miner is not interested in anything but four o'clock and payday." While that is not far from the truth, it cannot be said to apply solely to miners. The majority of workers regardless of their occupation have much the same characteristics, in reference to the hours they work and the compensation they receive.

Bearing these facts in mind when we make certain rules, the first thing to be done is to start a campaign of getting the men interested in their own safety. It is useless to draft a set of rules and hand a copy of them to each workman, expecting that they will read them carefully and everything will go along well from that time, as though the system was to be automatic. We shall soon learn that the rules might as well never have been published.

Naturally, men follow the lines of least resistance; and the success of any system we would inaugurate must make that line lie in the direction of safety. Too often, the idea prevails among workers that "rules are made to be broken." Of course, they mean it as a joke; but the joke generally becomes a reality and we learn too late that we have taken the wrong road to insure the success of our efforts.

A sign or a bulletin well worded and easily readable is the best foundation for starting a good mining cam-

paign of safety. For example, take a bulletin that reads somewhat as follows:

> "Never forget that the safety of an employee is more important than the work itself."

Such a bulletin can be read at a glance. Even the fellow than cannot read it will not fail to get the sense of it from those who have read it and comment on it freely. But, example goes further than precept and when it appears that the mine officials live up to the spirit of these signs and bulletins, posted in all conspicuous places and freely handed around among the men, results will follow.

Nothing is more important than insistence on strict compliance with rules and regulations on the part of mine officials and workmen alike. In my opinion, the suggestion that too strong insistence of this kind will cause men to quit and find work elsewhere is not true. Why men leave one mine and seek work in another is owing to the lack of good working conditions and not because a boss insists on safe mining practices.

Pikeville, Ky. GEORGE EDWARDS.

Good Light Needed in Firebossing

Close study of lamps and lighting conditions in gaseous mines—Time lost working with dim light—Firebosses' service neglected.

IT IS seldom that I have been more impressed than when reading the two letters that appeared in *Coal Age* Aug. 9, the one entitled, "Approving Use of Miner's Electric Cap Lamp by Firebosses," p. 217; and the other, "Give the Fireboss the Best Possible Light," p. 218. The writers of these two letters are to be congratulated on their statement of facts as they have found them.

For several years I traveled through both the anthracite and the bituminous regions, visiting the mines and working in the lamphouses. During that time I often made the rounds with firebosses, mine foremen and inspectors. My purpose in doing so was to make a close study of safety lamps and their use, in daily mining practice, in gaseous mines.

I wanted to obtain first-hand information regarding conditions of lighting, in the performance of work in the mine, in order to determine more exactly the requirements of lamps adapted to the work. What I learned in this manner has been of great advantage to me since and I can fully appreciate what a good light means to men working in a coal mine.

When going about with the men, as I have stated, all of whom were making their examination of the mines in the old way, by the dim light of a safety lamp, it appeared to me that much time was lost and the life of the examiner often menaced by losing his light and having to retreat in the darkness to a place where it would be safe to relight his lamp.

Let me say that one of the most valuable services rendered by a fireboss, a mine foreman or an inspector, in manking an examination of a mine, is being neglected by the management in failing to provide him with the best possible light, in addition to his safety lamp or other means of detecting the presence of gas. Attention has been drawn to the fact, which we all recognize, that gas is not the only danger that it is the duty of the examiner to seek to find, and these other dangers require a good light that will reveal their presence.

———, Pa. READER.

Inquiries Of General Interest

Use of Steel Mine-Track Ties in Heavy Motor Haulage

Proposed Long Haul with 10- or 12-Ton Locomotives — Steel Track Ties Not Recommended for Heavy Traffic — Conditions Must Determine

WE ARE about to lay 3,000 ft. of track, in the extension of our main locomotive haulage road. This track will be laid on an easy grade, where the bottom is hard and always level across the track. That is to say, there is no sidehill, giving an inclination that would have a tendency to spread the rails. One 10-ton and one 12-ton electric motor will be used to haul the empty cars from the shaft bottom to the inside parting and bring the loaded cars back to the shaft. The entire distance is nearly two miles for the round trip. Each locomotive will haul trips ranging from thirty to forty cars.

Before proceeding with this work, we are anxious to learn of any coal mine using iron or steel track ties, on a main haulage road where the locomotives weigh as much as ten or twelve tons. Assuming the ties are properly spaced and the rails heavy enough to carry the weight without bending or being thrown out of alignment, we desire to ask if steel track ties will stand up under this service and give satisfaction.

Wooden track ties are becoming more and more scarce each year, and their required size lessens the headroom or height above the rails by several inches. On this account, it is often necessary to shoot down the rock in many places on the haulage road. Further light on the subject by *Coal Age* will be appreciated.

Punxsutawney, Pa. R. W. WALKER.

This inquiry being submitted to A. F. Brosky, the Pittsburgh editor of *Coal Age*, brought the following response: "It is my belief that steel mine-track ties should never be used where 10- or 12-ton locomotives are employed on the main haulage road. During the last two years, I visited but one mine where steel track ties were used on butt entries. Such ties may work well where but a small tonnage is hauled, at a comparatively low speed, and the bottom is hard and not liable to heave. Also, the coal must lie practically level to obtain the best results in the use of iron and steel ties. While there are varying conditions that would cause exceptions to the rule, I think I am safe in saying that the use of steel track ties should be restricted to traffic where the weights of the locomotives do not much exceed six tons."

In addition to the question of rigidity, in steel ties for mine tracks, there must also be considered the question of the effect of corrosive or acid mine waters on the ties. The action of such waters on the metal may often greatly impair the efficiency of the tie and shorten its life. We agree with the suggestion that steel ties should not be used where the track is laid on a soft bottom, or there is the slightest tendency of the floor to heave.

Consideration must also be given to the fact that, in the use of steel ties, there is not the same opportunity afforded for the ballast to hold the track in place, as

where wooden ties are imbedded in the ballast, which holds them firmly and prevents shifting. This is an important factor where the track makes a sharp bend in rounding a curve and, in any case, where trips are hauled at a comparatively high speed.

In locomotive haulage, particularly where the traffic is heavy, the absolute rigidity of the track, which is assured by a solid roadbed, is of the first importance. The necessity of brushing the roof to secure the necessary headroom where wooden ties are used is a matter of secondary importance in the economic operation of the mine. We shall be glad to hear of the experience of others and learn their opinions in respect to the limitations in the use of iron or steel track ties, under heavy traffic.

Examination Questions Answered

Anthracite Foremen's Examination, Districts 8-14, Incl., 1923

(Selected Questions)

QUESTION—*With a fan developing 30 hp. at the fan and a water gage of 2.3 in., when but 50 per cent of useful effect is obtained, what quantity of air would be available?*

ANSWER—The useful effect being 50 per cent, the horsepower on the air is one-half that delivered to the fan. Therefore, the work performed on the air is $0.50 \times 30 \times 33{,}000 = 495{,}000$ ft.-lb. per min. The pressure corresponding to a water gage of 2.3 in., is $2.3 \times 5.2 = 11.96$ lb. per sq.ft. Finally, dividing the work performed on the air, expressed in foot-pounds per minute, by this unit pressure gives for the quantity of air in circulation, in this case, $495{,}000 \div 11.96 = 41{,}388$ cu.ft. per min.

QUESTION—*(a) What are permissible explosives? (b) What conditions make their use necessary in a mine? (c) What charge limit has been established by the U. S. Bureau of Mines for such explosives?*

ANSWER—(a) The term "permissible explosives" relates to any explosive that has passed the test and received the approval of the Bureau of Mines and is used according to the instructions and subject to the limitations placed on its use by the Bureau. Used under any other conditions, a so-called permissible explosive is no longer one in fact.

(b) Owing to all permissible explosives being practically flameless and possessing a greater degree of safety in the presence of gas or dust than black blasting powder, the use of a permissible explosive, instead of black powder, is essential in all mines generating gas or dust in quantities that render accidents in blasting possible through the ignition of the dust or gas by the flame of the shot.

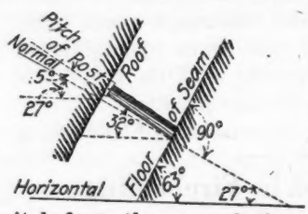
(c) The Bureau of Mines, in its Miners' Circular No. 2, p. 6, has prescribed a charge limit of 1½ lb. for all permissible powders used in blasting in a mine.

QUESTION—*What are the efficient limits to which the ventilation of a mine may be split?*

ANSWER—Dividing the air current into two or more separate splits reduces the velocity of the current in the same proportion. The limit of splitting is attained when the velocity of the passing air, at the working face or in any portion of the mine, is not sufficient to sweep away the gases lodged at the roof, in cavities or other void places and keep them clear from such accumulations. Also, the quantity of air in any single split must be sufficient to supply each man working on that current with the quantity of air required by the state mining law and as much more as may be necessary to make the place healthful and safe for work.

QUESTION—*The center props in a slope of 63 deg. pitch are set 5 deg. up the pitch. What is the pitch of the prop?*

ANSWER—In the accompanying figure is shown a portion of a slope having a pitch of 63 deg. with the horizontal. As indicated in the figure, a normal line in the seam or a line perpendicular to the roof and floor makes an angle of 90 — 63 = 27 deg. with the horizontal. But, since the post is set 5 deg. up the pitch from the normal, the pitch of the post or the angle it makes with the horizontal is 27 + 5 = 32 deg.



QUESTION—*A shaft 500 ft. in depth is to be enlarged; how would you proceed to do the work having special regard for the safety of the workmen?*

ANSWER—The answer to this question must depend on the style of the enlargement intended. The shaft may be a two-compartment shaft and it is desired to make a third compartment or manway, by excavating the material on one side of the shaft, which can be done with perfect safety without interrupting the hoisting of coal or interfering with the operation of the mine. Likewise, a single-compartment shaft may have to be enlarged so as to afford room for two compartments or more.

On the other hand, the question may call for increasing both dimensions of the shaft, making it wider and longer to accommodate larger cages and make possible an increased output of coal. In that case, the work can be done more speedily and effectively by closing down the mine for a month or two in the dull season. To attempt to cut the face of the shaft down while hoisting operations are in progress would be hazardous in the extreme.

Assuming the mine is closed down, the work of enlargement should be started at the surface by installing a templet of heavy timbers that will form the foundation of the new headframe to be erected later when the work is completed. The cage should then be lowered to a point 10 ft. below the surface and holes for cross-buntons cut in the curbing on the two faces of the shaft. Two heavy timbers should be inserted here as cross-buntons, at this point, keeping the cage always below them, using one cage only in this work. On these cross-buntons a platform of heavy 4-in. planks should be laid, for the support of the workmen while enlarging the shaft to the required dimensions. As the old curb timbers are taken out a few at a time, new timbers must be set in place and firmly wedged, supporting them temporarily by struts or posts resting on the solid formation below. In this manner, the work should proceed, in sections of 10 ft., throughout the entire depth of the shaft.

Force of Public Opinion Only Remedy for Coal Strikes

Fixed Code to Avert Tie-Ups Urged by Coal Commission in Report on Civil Liberties—Says Congress Should Take Jurisdiction When Miners or Operators Ignore Law—Indorses Open Shop

In a report to Congress on civil liberties in the coal industry made public Sept. 9 the U. S. Coal Commission enumerated the causes which induce strikes and interrupt interstate commerce, and made recommendations that might help to prevent strikes which threaten cessation of production by the miners. The commission refused to endorse the principle of the closed shop, contending that it was the right of the producers to operate their properties as they pleased, if the laws of the nation were observed. It was the right of the miners, also, the commission held, to organize for collective bargaining, but they, too, must respect the law.

The report follows in full:

TO THE PRESIDENT AND THE CONGRESS OF THE UNITED STATES:

In an attempt to answer the inquiry of the Congress with reference to the "causes which from time to time induce strikes, thereby depriving interstate carriers of their fuel supply and otherwise interrupting the flow of commerce," the Commission finds that a very large part of the friction which from time to time has stopped the machinery of production and frequently resulted in violence and bloodshed has arisen from:

(1) Disputes as to what are popularly known as the civil rights of American citizens.

(2) Practical breach of these rights in the operation of the industry, even when they are theoretically acknowledged.

(3) The inappropriate application to present conditions of principles enunciated under totally different economic conditions.

(4) Attitudes of public opinion produced by ancient grievances.

(5) Lax administration of the law induced through fear, favor, affection, malice, hatred, or ill-will.

(6) Unwise even though lawful interference of strangers in local conditions.

(7) The effect of universal suffrage upon law administration.

The Right to Run an Open Shop.—There is no intellectual dispute touching the academic proposition of the right of a man to run an open shop, nor of the right of men to organize for the purposes of collective bargaining. The non-union mine operator freely admits the right to form a union. He will not, however, employ union men to work beside non-union men in his mines, assigning as a reason therefor that they are trouble breeders. In other words, when reduced to the actualities of the industry the open shop of the non-union operator is the open mine for non-union labor but closed to union labor. On the other side of the controversy officials of the United Mine Workers of America, in theory, or in the absence of a contract made, admit the principle of the open shop and the legal right of the individual to work therein, but they refuse to work with non-union men, assigning as a reason therefor that no man has any right to obtain benefits which accrue to him through the activities of the United Mine Workers of America and not become a member thereof, pay his dues, and bear his share of the expenses. Thus, the mine workers have also their open shop, but it is open actually only to members of the union.

Those who choose to do so may examine the statement of facts, the affidavits or other documents, and the arguments presented to the Commission upon these subjects. The Commission does not deem it either necessary or advisable to insert these documents in this report, nor to attempt to fix ultimate responsibility. Many, if not all, on both sides are at fault and all have some excuse arising from the weaknesses and passions of human nature. It is sufficient to say that a certain type of mind could reach the conclusion from public statements made, both by the United Mine Workers and union operators, that it was the purpose of this organization to unionize all the mines of America, peaceably if it could, forcibly if it must. Another type of mind could satisfy itself that the operators of non-union mines propose to keep their mines from being unionized—peaceably if they can and forcibly if they must. Neither of these conclusions would add anything to the sum of human knowledge with reference to actual conditions and attitudes of mind in the mining industry.

The Commission does not find, notwithstanding many unfortunate occurrences, unlawful acts, and unwise statements that it is or has been the ultimate object of the officials of the United Mine Workers of America to unionize all the mines by force if necessary. Upon the other hand, it does not find, regardless of unfortunate statements and unlawful conduct, that it is the fixed purpose of non-union operators to destroy the United Mine Workers of America. The Commission chooses rather to give those who are from the moral standpoint, whatever it may be from the legal standpoint, charged with violation of the law the benefit of the doubt as to criminal intent. The Commission does not believe that the running down of the different unlawful occurrences in the mining industry of this country to the original breach of the law, if it could be found, fixing the responsibility therefor, and then strengthening the case by all subsequent acts of violence and intimidation of like character as set forth in the brief of counsel, would afford any justification, whatever, save as such justification may be found in the common and ordinary passions of mankind, for the other side to have met force by force, to have fought fire with fire.

Relates Some History of Herrin.—The Commission reports certain facts which it believes will give to the Congress and the people a clear understanding of the real situation:

Herrin, Ill., is situated in Williamson County. That county is an American community. Of the 61,092 population given by the last census, 54,052 are white native born and 1,825 are negroes; the foreign born are principally Italians, Russians, Lithuanians and Southern Slavs. Of the native whites, 1,265, or 3.2 per cent, are illiterate, while of the foreign born 30 per cent are illiterate. The native born are the descendants of two streams of immigrants, one from the North composed largely of Pennsylania Germans, and the other, and predominating element, being from the mountains of Kentucky and Tennessee with some contributions from Alabama and the Carolinas. The community has distinctly a Southern flavor in both dialect and personality.

The soil of the county is largely of a light red clay. Before the beginning of the era of coal mining the inhabitants eked out a precarious existence by agriculture. Then one of the richest coal regions in the world was discovered. Almost the entire country was underlaid with three veins of superior bituminous coal. The population gradually changed in reliance for a livelihood from agriculture to the coal-mining industry, which supports three cities of 10,000 population each and several smaller ones. It has splendid residences, fine business blocks, good schools, churches and lodges. It has more automobiles than any county in the state save Cook. It has a certain lawless element and many feuds. The blood of the people is such that they fight for their convictions. It has more homicides than any other county in the state except Cook. It is intensely patriotic and had a fine record during the World War. Its people are intelligent, soft-spoken, extremely religious, not given to profanity, and would resent any suggestion that they were not good, patriotic, American citizens. How can one account for the execration of such a county as this at the hands of the American people? It is not difficult to find the reason when the facts are known.

When mining began in that county it was upon a ruinously competitive basis. Profit was the sole object; the life

and health of the employees was of no moment. Men worked in water half way up to their knees, in gas-filled rooms, in unventilated mines where the air was so foul that no man could work long without seriously impairing his health. There was no workmen's compensation law; accidents were frequent and there was no common ground upon which employer and employees could meet. They had no interests in common, and they regarded each other with hostility and distrust. The average daily wage of the miner was from $1.25 to $2.

Then came the union in 1898 and 1899. Peace and goodwill and mutual respect have been the general rule since that time. The Workmen's Compensation Law was enacted. Earnings advanced to $7, and even to $15 a day; improvement in the working conditions was reflected in the appearance of the workman, their families, their manner of life and their growing cities and public improvements. There are 13,000 miners in the county, 62 per cent of whom own their own homes, and most of them own automobiles. All occupations are unionized. They believe in the union, for they think it brought them out of the land of bondage into the promised land when their government had been careless or indifferent to their needs. They hold themselves to be good Americans and proved it during the Great War, but what they have of daily comfort they think comes from the union and not from the government.

The county was 100 per cent unionized when the promoter of the Southern Illinois Coal Co., started in as a "wildcatter" to operate a strip mine, investing in it some $250,000 or more. In April, 1922, he secured the consent of the union to work at uncovering the coal during the strike with the promise that there would be no production of coal. The union men were discharged June 13. Then workmen from the labor agency in Chicago began to appear and armed guards from the Hargraves Detective Agency were placed about the mine to protect it. These facts indicate that he intended to work the mine and feared trouble.

A call from Chicago was made on the Adjutant General on June 17 for troops although there had been no attack on the mine at that time. Workmen arriving from Chicago had been intimidated and some turned back. It is not needful to report the acrimonious controversy between Colonel Hunter and the Adjutant General of Illinois with reference to the responsibility for failure to secure the presence of the State militia. The highway ran by the Lester mine and persons traveling it were stopped by armed guards. Stories were circulated that they assaulted travelers on the highway, held up and robbed people, insulted women, and that they were guilty of general terrorism. Some were pure fabrications, other grossly exaggerated, while others were true. The report went out that the sheriff had been killed in an attempt to interfere with the unlawful activities of the guards. Pickets loitered about the mine, and assumed a provocative attitude. The mine owner appealed to the sheriff through his superintendent. The sheriff visited the mine, but made no effort to prevent the trouble. He was a union miner until elected sheriff, and was at that time candidate for County Treasurer, and later was elected by an overwhelming majority.

The State's Attorney, operators, union officers, and citizens appealed to the owner and his superintendent to cease operations, and warned them that bloodshed was certain. They replied that they had been in such situations before and knew how to take care of themselves. On Wednesday morning, June 21, a party of workmen for the mine was detrained at Carbondale and started overland in a truck for the mine, piloted by an automobile. They were ambushed and four men were wounded, one mortally. The same unlawful mob raided hardware stores at Herrin and Marion and took all guns, revolvers and ammunition, telling the proprietors to charge them to the locals. Wednesday afternoon a large force of armed men surrounded the mines and three union men were killed. One of them, George Henderson, known as "Geordy," was a popular favorite, and the story was circulated that he was killed while attempting to reach the mine for a peace parlay. In the evening an airplane reconnoitered the fortress, and Robert Officer, an office man at the mine and one of the survivors, claimed that the airplane dropped bombs on the mine, but as the attacking force was using dynamite he could easily have been mistaken.

Flag of Truce Fired On.—Conference after conference took place in the hope of adjusting the situation. Shortly after daybreak Thursday morning firing began again. The survivors of the mine claimed their white flag was fired on and ignored. The besiegers claim the besieged fired from under the white flag. The fight did not last long, and there was a parley. It was agreed that the besieged should march out unarmed and have safe conduct out of the county. It is reasonably certain that those who made the promise made it in good faith; but in the meantime recruits were arriving by the hundreds, not only from Williamson County but from adjacent counties.

The crowd became rampant. It was reported that troops were on the way. This, added to previous stories, made the crowd wild for revenge. The fact that most of the stories were untrue made no difference; they believed them and acted accordingly. Three-fourths of a mile from the mine, McDowell, the superintendent, was taken from the line of prisoners and killed. Then someone suggested that they "kill them all and stop the breed." The suggestion was acted upon and the men were taken from the road into the wood, lined up before a barbed wire fence, and told to run. As they ran, while climbing the barbed wire fence, the mob fired.

There were between 40 and 60 prisoners; 16 were killed at or near the barbed wire fence; some escaped and were never captured. Hunting parties pursued those who escaped. Six men, four of whom were wounded, were rounded up by a portion of the mob and taken into the city of Herrin. They were tied together by their necks, marched to the cemetery, and butchered. After they were shot down, two or three of them who cried for water had their throats cut. Strange to relate, one of them survived and was able to tell afterward how one of the mob expressed impatience at his tenacious hold on life, and kneeling with one knee on his chest, he took the helpless man by the ear, and twisted his head around so that he had easy access to his throat, which he then slit with a pocket knife. Nobody will ever know how many were killed; the best estimate is twenty-five. After the surrender of the men, the steam shovels and all other equipment were dynamited and burned.

Neither the sheriff nor any of his deputies interfered or even visited the scene. The police officers of Herrin ignored the march through one of the paved streets of the city of the six prisoners and their execution at the cemetery, although all the rest of the population knew about it and many followed and witnessed the tragedy.

Questions Communism Charge.—It has been suggested that this was a communistic movement. It is true that communists have made efforts to establish organizations in that county and that a few foreigners were induced to join; but there is no evidence that this had any relation to this lamentable and horrible occurrence. The voters are intensely partisan and divide along normal party lines with a negligible Socialist vote.

These homicides took place in the presence of innumerable witnesses. It cannot be true that the persons or many of them who engaged in the mob are not known to numbers of the citizens of that county. If those indicted, tried and acquitted were not guilty, there must be many people in Williamson County who know who the guilty ones are. Yet there has been no conviction for this breach of the criminal law nor is there the remotest possibility there ever will be one.

Coroner's Jury Voices Local Viewpoint.—The local point of view is well stated in the verdict of the Coroner's jury: "We, the jury, find from the evidence that the deaths of decedents were due to the acts, direct and indirect, of the officials of the Southern Illinois Coal Co. We recommend that an investigation be conducted for the purpose of fixing the blame personally on individuals responsible."

There is no doubt that when the promoter of the Southern Illinois Coal Co. started to operate his mine in defiance of

the union, he was inviting mob violence and flirting with death; he knew it and prepared to meet it. The resentment was spontaneous and instantaneous. He challenged the supremacy of the union. Those in the mob undoubtedly believed that it was an attempt to return to old conditions before the mines had been unionized. There were, of course, fatal omissions of duty on the part of public officials, and neither the officials nor the public wanted troops to protect the operator in his union-destroying operations. It might have been stopped by the sheriff, by the officers of the miners' union, by public sentiment, but all were for the union and all believed that an attempt was being made to destroy it.

Although the Commission finds that the tragedy might have been prevented, it also finds that the union officials and the public officials never anticipated that it would happen. They all believed that the non-union miners would be kicked out of the county and that this would end it. Then came into the equation an unknown quantity. Nobody can tell how much this had to do with the failure to punish the members of the mob. It was the storm of protest that swept through the public press of this country. It was the condemnation of the union, the union officials, and the public officers. It presented the common aspect of a stranger interfering in a family row. The Commission, of course, cannot say what might have been the result if public opinion had waited until the courts had either attempted or refused to discharge their duty. But the whole economic life of the county puts it beyond peradventure that when an indiscriminate assault on the union and the people of the county was made it rendered the punishment of anybody impossible in that county.

Finds No Justification for Union Audacity.—This statement, unfortunately, cannot end here. Clothed with all the charitable excuses above set out, these furnish no justification for the brazen audacity with which subordinate officials and members of the United Mine Workers of America defended the crime and the criminals. That they were espousing the cause and defending the lawbreakers is further shown to the Commission by the fact that they have since bought the mine where the tragedy occurred, and have paid therefor $729,000.

Bearing in mind the changed and bettered conditions which came to this country through the unionization of its mines, with its resultant attitude of mind toward non-union labor, the Commission calls attention to the fact that the bituminous mines north of the Ohio had also become largely unionized. These mines came into competition with certain non-union mines in parts of Pennsylvania, West Virginia and Kentucky. It was felt by union operators that the non-union mines either undersold them in the market or made a greater profit than their own and that this was due to cheaper labor. How far these operators desired the United Mine Workers to go in unionizing mines would be mere conjecture, but there is no doubt of their desire to equalize conditions by bringing the non-union mines under union control. That vast sums of money have been spent in this effort; that rioting and bloodshed and destruction of property have taken place, is beyond doubt. For years the controversy has gone on.

The area of greatest civic disturbances has been the counties of Mercer, McDowell, Mingo, Wayne, Boone, Logan and Kanawha, in West Virginia, and the counties of Johnson, Pike, Harlan and Bell in Kentucky. All of these counties are mountainous, underlaid with rich veins of coal. They were almost exclusively peopled by mountaineers, native whites of ancient American ancestry. They were a law unto themselves. Their annals are crimson with feuds and the gun was the "supreme court." The coal-mining industry has introduced large numbers of negroes, as well as foreign-born and native whites from other sections of the country; still the local traditions exert a dominating influence and account very largely for the outbreaks of violence. Much of this violence had nothing to do with the coal industry but had to do with the nature and racial characteristics of the people, yet it has furnished excellent argument for one side or the other. The primitive conditions of life of this people can scarcely be paralleled anywhere, unless in the mountains of North Carolina and Tennessee.

The mountains of West Virginia come down to a point like the letter V and down this narrow crease flows a small river; leading into this from a smaller valley there will be a creek, into the creek a branch, and into the branch a fork. The nomenclature of the entire region is based upon the names of these rivers, creeks, branches and forks; towns, camps, mines and railroads being named after them, and each constituting a little world within itself. Each district is separated from its neighbor by a mountain range, or ridge, with no roads or direct means of communication. Agriculture is meager and primitive, and the homes are for the most part, small whitewashed dwellings or log cabins in keeping with the poverty-stricken surroundings.

While these regions were undeveloped the coal mines had only a potential value because of the difficulty and cost of constructing railroads and getting the coal to market. The exploitation of this coal was nearly coincident with the growth of the United Mine Workers, though parts of this general region had been organized long prior to the events of 1919.

Preparations to Unionize Unorganized Fields.—There were serious labor troubles in 1912-1913, after which there was a period of quiet until the extraordinary demand for coal during the World War. At the same time the union made elaborate preparations to unionize the unorganized fields. The topography of the country, the sparseness of the population, the isolation of the valleys one from the other, the general poverty of the counties, lack of level ground upon which to build towns, and the fact that mining machinery and equipment were usually on leased ground are all important factors in the situation. The operator had to establish his business where the coal was and bring his labor to it. He had to construct houses for his employees and furnish them with necessary appurtenances, such as water supply, and establish stores where they might purchase food and clothing. He arranged for medical attendance and hospital service, provided for schools and school houses, employed teachers, or, at least, paid part of their wages, and endowed churches and community buildings.

Thus it appears that each mine or group of mines became a social center, with no privately owned property except the mine and no public places or public highways except the bed of the creek which flowed between the mountain walls. These groups of villages dot the mountain sides down the river valleys, and need only castles, drawbridges and donjon-keeps to reproduce to the physical eye a view of feudal days. There are no public corporations in many places to provide for the public welfare or to maintain law and order, so the mine owner had one of his employees deputized by the sheriff, and thus came into existence the much discussed "mine guard." As the employees were the only ones who were furnished homes, and their occupancy was contingent upon their employment, the courts of that state have decided that the relation of landlord and tenant did not exist, but that it was the relation of master and servant and when the employment ceased the mine owner came into possession of the house.

Thus the position of the miners in company-owned houses is anomalous. They are not tenants and have no more rights than a domestic servant who occupies a room in the household of the employer. The documents which pass for leases often give the company complete control over the social life of the families who live in the houses owned by the company. One which has been called to the Commission's attention from Fayette County, Pennsylvania, actually stipulates that the lessee "hereby further agrees not to use, allow, suffer or permit the use of said premises, or the private ways or roads through and over other lands of the lessor used to reach said premises from the public road, for any purpose other than going in to said premises from the public road, and out from the same to said public road, by himself and the members of his family; and further to do no act or thing, nor suffer or cause the same to be done, whereby the public or any person or persons whomsoever, may be invited or allowed to go or trespass upon said

premises, or upon said private ways or roads, or upon other grounds of the lessor, except physicians attending the lessee and his family; teamsters or draymen moving lessee and his family belongings into said premises or away from the same; and undertakers with hearse, carriages and drivers, and friends, in case of death of the lessee or any member of his family."

Why Miners Seek Own Remedies.—Under existing laws the miners have a legal right to sign and the companies have a right to require them to sign such leases as a condition of obtaining employment. That they are ill-advised, obnoxious and inconsistent with the spirit of free local communities hardly requires argument. Self-respecting American citizens will find a way to put an end to them. In the case of a helpless, submerged working population, the legislatures of the several states might well consider making such "leases" illegal, like any other contract which is contrary to the public interest. Self-respecting American miners, who have on other occasions shown themselves by no means contemptible defenders of their own interests, may prefer to take the remedy into their own hands and by insisting on reasonable leases, on the incorporation of their villages, and otherwise, win for themselves those elementary civil liberties which must always be won and held by free peoples for themselves rather than thrust upon them by external benevolence.

Operators rarely, if ever, reside at the mines; managers and superintendents were the possessors of all the authority, both public and private.

Whether there was an agreement between the United Mine Workers and the Operators' Association of the Central Competitive Field by the terms of which the union was to undertake the complete organization of the West Virginia and Kentucky fields is the question involved in an injunction suit tried before the Judge of the U. S. District Court for the Southern District of West Virginia, the evidence in which was concluded June 3, 1923. For the purposes of finding the facts which this Commission deems of moment to Congress it is not needful that the Commission should consider this question.

If one were to assume at their face value the statements presented by non-union operators, together with the record of convictions in the courts, he would be justified in finding that it was the deliberate purpose of the United Mine Workers to compel all operators to unionize their mines, and force agreement, not only with reference to wages and working conditions but the check-off and other matters. If, upon the other hand, statements with reference to intimidation and violence exercised toward the mine workers are taken at their face value, one would be justified in finding that a vast majority of the miners of this country were sincerely desirous of joining the union, paying the check-off and delegating to a central body for settlement, subject to their ratification, all questions of wages and working conditions in the industry. Blacklisting can clearly be proven from the testimony; it can clearly be shown from counter testimony that it has ceased to be used.

Much Testimony from Both Sides Valueless.—But the Commission is unwilling to guess as to the truth. A large part of the testimony furnished is absolutely valueless. It consists of statements and affidavits. It is not surprising that the laymen could believe these things, but that lawyers could try to impress the Commission with the absolute verity of these statements is somewhat remarkable. No opportunity has been afforded for cross-examination. No means have been devised to punish anyone for perjury. There is no way in which the Commission can test the interest, bias and prejudice of the witness that may be done in an ordinary lawsuit. Nor would men, when moved by self-interest, refuse to admit that acquittal or convictions cannot be relied upon as furnishing the absolute truth of the guilt or innocence of the parties charged. The verdict is as likely to come out of the atmosphere as it is out of the evidence.

Of course, there are men in the non-union fields who desire the union. How many, nobody knows, nor will there be any way of telling until the rights of American citizens have not only been admitted but have been guaranteed to them by the courts and officials of this country. Without minimizing the number who may have desired to join the union, it is nevertheless the truth that in 1919 the United Mine Workers began an extensive drive to unionize the remaining unorganized fields of West Virginia. Although many of the miners desired unionization, it does not appear that this was a spontaneous movement of the non-union miners but rather an attempt by professionals especially skilled and trained in the art. Only a secret ballot conducted under absolutely impartial conditions could determine the actual attitude of the majority of the miners.

How Union Organizers Work.—The system has been that organizers go to a camp or mine village and the nucleus of a local is formed. Then a committee from the local waits on the superintendent, and demands that the operators sign a contract recognizing the union, making the mine closed to non-union labor and granting the check-off. On refusal a strike is called, and this inevitably leads to complications. The striking miners occupy the houses of the operators, and operations cannot be resumed until the operators dispossess them and fill their places with other employees. The strikers refuse to vacate the houses and evictions follow. This starts hostilities. The organizers find a suitable spot in the vicinity, erect tents and furnish relief funds for the evicted miners and their families. An armed truce exists, ultimately breaking into open war. Owing to the rugged nature of the country, men can secrete themselves on the mountain sides of the narrow valleys and with long-range rifles shoot into the tipple or mine shaft. The power house or tipple is dynamited and destroyed. Workers are ambushed and killed.

The operator appeals to the sheriff. The sheriff informs the operator that he has no deputy to spare and no funds to hire deputies with. The deputies are not appointed by the sheriff, but by the county court, and in some instances the court has appointed deputies at the expense of the operators. The miners regard these deputies as hirelings of the operators, and thus the bitterness and hostilities grow until the mine is put out of operation because workmen are afraid to stay at the mine, or because the mine is destroyed. The United Mine Workers of America have paid more than $400,000 in damages for the destruction of the Willis Branch Coal Co.'s mines.

Organizers Build Up Class Hatred.—Sometimes the first acts of an organizer is to denounce constituted authorities, advise armed resistance to civil process and police control of public order. This foolish talk is naturally creating a feeling of resentment and hostility upon the part of public officials, which runs from the Governor down to the local constable; it is reflected by business and professional men and practically all classes not directly affiliated with labor unions. Thus class hatred has grown up, which may well be compared to the family feuds that formerly existed in this mountainous district. Hatred, bitterness and mendacity are cultivated on all hands as virtues, and it is difficult to put your finger upon a statement that you know is absolutely true.

The other side of the situation is that the operators of non-union mines are thus far determined never to enter into contractual relations with the union. Entrenched in their mountain strongholds, with control of the local governments and with ownership or possession of all the lands, they feel that they have an economic advantage so long as the union can be kept out. They stop the union at the mouth of the valley. Many require applicants for jobs to sign what is commonly called the "yellow-dog" contract, justifying it by pointing out that the union when in control requires the employer to sign a similar "yellow-dog" contract. Members of the union are discharged and blacklisted.

Many operators, however, do not use the "yellow-dog" contract, believing that it is immoral, or at least a tactical blunder, and that it has resulted in more harm than good. All sorts of opinions are expressed by the miners in these fields. Many of them worked formerly in union mines, and were not pleased with the "check-off" and union rules, and migrated to non-union districts to escape the unions. Many of them are seasonal miners, small farmers and other

workers, who come to the mines in the busy season, where they work at odd intervals. These men are not interested in the union and do not care to belong to it. The non-union miner also reaps the advantage and bears none of the burdens of the union.

How Mine-Guard System Originated. — The non-union mines are not run as they were in Illinois before the union took charge. There has been a great improvement in wages and in working and living conditions, and thus incidentally the United Mine Workers have bettered the conditions of those who are not members of their organization. The so-called mine-guard system is a result of the inability of local government to maintain law and order. Take Logan County, West Virginia, as an example. It covers over four hundred square miles of bold mountains. The Guyan River traverses it for thirty-five miles, and fifty thousand people live in scattered mine camps perched on the mountainsides along the river. Logan is the only town of considerable size, and there are but two incorporated towns outside of it, in the valley.

These numerous mining camps contain native whites, blacks, and foreign born, the latter varying with the camps but averaging 20 to 25 per cent. There are 70 companies operating 145 mines. Tax rates on land are necessarily low, as a high rate would prove confiscatory to the farmers, although farming is a negligible factor in the economic situation. The taxes raised are insufficient to maintain a large force of peace officers, although crimes by violence and moonshining are frequent throughout the mountain regions. So there came into existence what is commonly known as a mine guard, an officer appointed by the courts and paid by the operator.

The clamor raised against these deputies caused a change in the method of paying them. The operators now "loan" the county an amount equal to the extra cost of maintaining these special deputies. There is no record that these "loans" have been repaid and the operators do not seem to be pressing for payment. In Logan County the sheriff has nine regular deputies and many others who are stationed at the mines. Many of these are stable bosses, paymasters, and office guards, sanitary officers, etc. One of their special duties is to keep a sharp lookout for union organizers, and to devise ways and means to discourage them from remaining longer than the next train. The steep mountainsides converge at the banks of the Guyan River and a railroad bed has been cut out of the side of the mountain. There is here and there an impassable road, but generally speaking, all the ground except the bed of the creek is privately owned, and a union organizer can scarcely move off the station grounds without becoming, technically at least, a trespasser.

Once his business is discovered, it is the duty of the deputy sheriffs to prevent his activity by ejecting him from privately owned property. Actually, without the consent of the operators, a union organizer can do little more than ride on a train and look out of the windows. The operators' associations do not deny that it is their determination to keep out organizers, or "agitators," as they call them. They assert that their right to exclude objectionable persons from their mine property is as clear as the right of a manufacturer in Chicago or a home-owner in Washington to exclude undesirable persons from their premises. Whatever may be the legal phase, it is undobtedly a fact that under present conditions, Logan County, as well as Mingo and McDowell counties, West Virginia, are now closed to representatives of the miners' union, especially if they engage in union activities.

The operators claim that the exclusion of the organizers has prevented destruction of property and loss of life, while the miners claim that the presence of armed men about the mines is bitterly resented by the workmen and that the ultimate result is an uprising against a system amounting to peonage.

Nine Hundred Indictments Pending in Johnson County.— These theories may be illustrated by Johnson County, Kentucky. It is a small county in population, probably 15,000, almost all white, who are typical mountaineers. There are now pending on the Criminal Court calendar 900 indictments. Each grand jury returns 250 to 300 indictments, and meets four times a year. The sheriff is a mountaineer, and before his election was a union miner. At Thealka and Van Lear, near Paintsville, the county seat, are the mines of the Northeast Coal Co. and the Consolidation Coal Co. The relations of these companies with their men had always been harmonious until the calling of a strike by the miners' union.

The officials of the companies applied to the sheriff for protection, they, at that time, having no guards. He refused, and the reason for his refusal is a subject of dispute. The operators allege that the sheriff refused to appoint any deputies to guard the property, while the sheriff insists he was willing to appoint deputies, but refused to accept those nominated by the coal companies. There were no deputies appointed. Shortly afterward, men going to and from work at the mines were ambushed and shot. A local constable at Paintsville appointed twelve deputies who attempted to protect the mines and miners at Thealka, but without success, as two men at the Thealka mine were blown up by dynamite and killed.

The experience of the Consolidation Coal Co. at Van Lear was similar to that of the Northeast Coal Co. at Thealka. After workmen had been threatened and intimidated, the town board of Van Lear authorized the town marshal to appoint ten deputies. During this strike the drift mouth of the mine at Muddy Branch was dynamited.

Logan County, West Virginia, and Johnson County, Kentucky, are compared for the reason that at the outbreak of trouble in Johnson County the sheriff was the secretary-treasurer of the miners' local. There were no mine guards in the county, and the violence that broke out could not be justly chargeable to anything except a determination on the part of the strikers that the mines could not operate unless they accepted union terms. During all this strike district officers and organizers were busy in Johnson County. The Commission received a telegram from the president of District No. 30, and the secretary-treasurer, dated Paintsville, April 5, stating that their lives were menaced by mine guards. No confirmation of this telegram could be secured. The sheriff, a friend of these union officials, never heard of the affair, and no other person could be found who knew anything about it.

The irrepressible conflict between the organizers of the United Mine Workers and the non-union operators and miners, with the racial traits and characteristics above described, together with the inability of the state and local authorities to cope with the situation, is the real cause, not the mine guard. That, however, a public police official should be privately paid is indefensible. It is so admitted to be by the Governor of West Virginia.

There seems to be no evidence that people have been interfered with, either in the free use of the mails or in the receipt of their mail.

Public Officials Resent Unionization Plans.—There is now a practical cessation of violence in the coal fields of West Virginia and Kentucky due to the activity of state and county authorities in prosecuting and convicting persons, to proceedings in the federal and state courts for injunction, and to the desire of both sides to prevent their cause being prejudiced by unlawful acts. Unionism in the Logan, Mingo and northeastern Kentucky fields is not largely the outgrowth of local sentiment but is the result of a campaign of foreign organizers. The United Mine Workers do not deny that it is their purpose to unionize these mines if possible. This is so deeply resented by public officials and all other persons not engaged in mining that free travel, free speech and public assemblage has been practically abridged. The foreign element is not responsible for any of the troubles that have occurred.

The conditions now are those of an armistice which, unless peace can be secured with a better understanding, is liable to break down in trouble, resulting in riot, bloodshed and destruction of property.

Recurring to the Herrin (Ill.) situation, there is indisputable proof that three union miners were killed and that no attempt has been made to ascertain or to punish the guilty parties. There is no doubt that what are commonly

known as strike breakers, gunmen or thugs were brought to that county thoroughly equipped with arms and ammunition, and perfectly willing to shoot with or without provocation.

It is not needful to report further facts about this unfortunate condition of economic life, wherein so many criminals have gone unwhipped of justice. That the election of officers by the people has something to do with the administration of justice can not be denied. Where the territory is unionized and the officials are elected by the vote of the union miners, they naturally have a friendly feeling for the United Mine Workers. Where it is non-union and they are elected by men who are opposed to the union, a like condition of mind necessarily exists.

The inquiry will naturally arise, if the Commission is unwilling to fix ultimate responsibility for the destruction of life and property, leading to strikes, riot, tumult and disorder, how it justifies such a finding. The disregard of the civil rights of American citizens, as commonly understood by those who are versed in our principles of government, the breaches of the criminal law of the land, the frequent immunity from punishment, and the occasional unjust conviction of men, has heretofore been viewed exclusively from an altruistic standpoint.

The Commission would impress upon the law-making power of the land and the common sense of our people this ever to be remembered fact: All justice is human and fallible. Always its enforcement depends upon the education, environment and heredity of the people who are called upon to enforce it. It will only approach perfection when the intelligence, the judgment and the conscience of men are educated more and more toward higher ideals. It would not be fair to omit from the equation in West Virginia the outlook of the people upon what is commonly called law and order. It would be unjust to fix the responsibility of non-union operators by charging them with the effects of racial characteristics.

Justifying a Feud.—It was not the intention of the Commission to quote evidence in this report, but the idea it entertains can be gleaned by relating a conversation had with two bright fifteen-year-old boys of Anglo-Saxon origin, engaged in social work, and living in eastern Kentucky. Asked how they explained that a religious people such as they were could justify the feud, the explanation diffused a startling light upon the situation. It was this: "I become fearful that my neighbor is going to kill me. I have no desire to take his life, but I have a right to defend my own. It is his life or mine, and so I kill him. Fear that he may kill me constitutes the right of self-defense, even to the taking of his life."

That fairly expresses the outlook. What goes to the defense of one's life goes also to the defense of one's home and one's property. It is a mistaken idea, but it accounts for much of the trouble where all men go armed. On the other hand, you may take a union organized territory such as Williamson County, Illinois, and so strong has grown the opinion of the rights of unionism that its people, however, mistakenly, quite honestly believe that they have a right to resist, even to the taking of life, the interference by anyone with the privileges of organized labor. In either district the enforcement or lack of enforcement of the law shocks the moral sensibilities of that great body of Americans who believe that the courts and the police officers are to be the preservers of our rights and the defenders of our liberties.

But while these ideas remain instilled in the minds of these men and are not removed by educating them along different lines of thought, however much it may be and should be deprecated, the judgments of the courts and the verdicts of juries will speak the common conscience of the multitude over whom they preside. For years this irrepressible conflict between the undoubted right of a man to operate his property as he pleases in America and the undoubted right of men to organize for collective bargaining with reference to wages and working conditions has gone on. Principles of government, acknowledged, admitted, have been tossed into the scrap heap every time they have faced actual conditions. The law has been, is now, and ever will be but the average of the judgment and conscience of the community.

From each of these two sides the Commission sought helpful suggestions with reference to minimizing, and in time ending, these denials of civil rights leading to breaches of the criminal law. So obsessed with the eternal verity of its particular right has each side been, that the only solution has been the destruction by legislative enactment of the other fellow's right.

The non-union operators and miners have suggested: "Break up the United Mine Workers of America and all will be well with the world."

The United Mine Workers of America have said: "Unionize all the mines and peace will brood over a war-worn industry."

Each Side Wants Peace by Suppressing the Other.—Each admits the principle in which the other believes, but each is quite satisfied that peace can only come by killing the other fellow's principle. Unfortunately, the Commission cannot kill principle. It is not a lord high executioner authorized to take anybody's statement as to what will produce peace, and either destroy the United Mine Workers of America or force the unionization of all the mines. The Commission has been compelled to consider the viewpoint of each and to report upon these well-known facts what, if anything, can be done to spell peace and prevent strikes or lockouts.

The condition resembles the conflict between the definition in the Declaration of Independence concerning human rights and the then clearly constitutional right of human slavery. The great mass of those arrayed upon either side were unwilling to compromise or adjust. It was permitted to go on until the agony of a fraternal war solved the problem. It is to be hoped that we have learned wisdom by experience. There is a patriotic side to this question which is of more compelling force in the mind of the Commission than even the economic one. A democracy that cannot spell peace with justice will sooner or later be succeeded by a government that will spell peace regardless of justice. The owners of these mines have a right to operate them as they please, if they be but a mere business enterprise. But the Commission believes that absolutely necessary as their output is, not only to interstate commerce but to the comfort of the whole people, it is their patriotic duty to make some personal sacrifices in the interest of the common weal, a principle equally applicable to the United Mine Workers.

The United Mine Workers of America have a right to exist. They have a right to bargain collectively as to wages and conditions under which they will labor. They have a right to place the authority for the determination of these questions where they will. They have a right to work or to refuse to work. They have a right, peaceably and by persuasion, to endeavor to swell their ranks.

In this clash of right, every red-blooded American in the industry should yield as much as is necessary of his unqualified legal right to the end that the mining industry may be owned and worked by loyal citizens, whether native born or naturalized, in the spirit of fairness toward the public and for the preservation of the principles of civil rights as now understood by the American people. It is the conflict between these rights that results in strikes and lockouts. It is the unwillingness to present controverted points to any sort of arbitration. Compulsory arbitration is not only impossible but inadvisable. Voluntary arbitration is desirable.

Some difficulty has confronted voluntary arbitration in the past as has confronted the Kansas Industrial Court. No difference on which side of the line one may stand, one naturally fears, and unjustly so, the submission of questions to even voluntary arbitration when up to the present time no yardstick has been prepared by which the arbitrators are unqualifiedly required to measure the facts. One of the evils of today in American life is government by discretion. The sooner we return to a government of laws and not of men, the sooner we may expect stability and peace. No individual man is willing to be tried by discretion. None can find fault by being tried by laws which he himself has helped to make.

Urges Voluntary Arbitration.—It is the opinion of the Commission, therefore, that certain standards should be adopted under which controversies touching the same should be submitted to voluntary arbitration. The Commission is of the opinion that an honest finding of the facts measured by the standards so set up will have such force of public opinion back of it as to compel its adoption and prevent cessation of work in the industry.

The Commission has considered the advisability of setting up a code by which through arbitration many of the questions involved might be tried, but it has reached the conclusion that these principles would far better be worked out by the operators and the miners and include in their contracts, as they would vary certainly from region to region and perhaps from mine to mine.

If industrial peace is to be hoped for—a peace that looks toward continuity of employment, stabilization and stimulation of production—then some method must be found to guarantee, as near as fallible human judgment may, equally exact justice to capital, to labor, and to the public. There must be one yardstick adopted by which all controverted questions are to be measured. Public interest demands that certain fixed principles shall be recognized by both capital and labor as this yardstick.

(1) No contract is of any valid binding force and effect in America which has not been freely and voluntarily entered into. No law could, therefore, be enacted compelling the making of contracts or fixing the terms and conditions thereof. But when once executed, contracts should be mutually binding upon the parties thereto, and each should be required to preserve scrupulously the same or be responsible to the other party in damages for the breach thereof.

(2) The right of a man to work when, where, for whom, under what conditions, and at what wage he chooses, so long as he elects to assert his individual right, must never be interfered with and the State must furnish him protection and peace while he exercises this right.

(3) In a free government men have a right to combine themselves together in organizations for collective bargaining with reference to terms and conditions under which they will work. They must exercise this right without force and intimidation, gathering into their ranks those who voluntarily desire to become members of the association, but they must not by coercion, duress, restraint, intimidation, or any species of violation of the criminal laws of the land, interfere with the right of the man who chooses to dispose of his time individually.

(4) When society consents to the formation of corporations of capital to engage in business, and grants the right of labor to bargain collectively with reference to wages and working conditions touching any of the prime necessities of life, and particularly with reference to that great public necessity, coal, society has a right to fix a limitation beyond which it will not permit either these *de facto* or *de jure* organizations to go. The public welfare is the thing to which private interests, as exercised through corporate organizations, must yield a certain measure of the inherent right of the individual. Therefore, a corporation, which is a creature of the state, must not be permitted to break up a *de facto* organization of labor in other ways than by argument and advice. Nor must it be permitted to prevent its employees from voluntarily organizing for lawful purposes. On the other hand, labor organizations must not attempt in other ways than by peaceful argument to induce men to join the union.

(5) Society ought not to shift its moral responsibility to look after its unfortunates onto individual persons, firms and corporations, but government ought not, and presumably does not, authorize the combination of capital, whether into partnerships or corporations, without the implied duty upon the part of such partnerships and corporations to pay to the humblest of its workers who is able-bodied, willing and competent, and who gives a good honest day's work in an occupation that may properly be considered a man's job sufficient wage to enable that person and his family to live in accordance with the standards of American life, and to pay in addition thereto for skill and experience and with reference to the irregularity of employment, and when thus it has provided for skill and experience, no organization or group has the right to hamper the initiative of the individual, preventing him from making all the money he can.

Recognition of the principle that wages should be sufficient to maintain an American standard of living does not imply approval of any particular current estimate of its cost, or that any stated income will insure such a standard in different localities where not only the cost of necessities but the habits and traditions of the people may differ in varying degrees.

(6) The necessaries of life are not obtainable from year to year at even a fixed price, eliminating the fluctuating purchasing power of the dollar. These fluctuations affect the industry no more than they affect the general public. The general public, commonly called the consumer, has a right to demand of its government that it shall not freeze in the midst of an abundance of coal. Unless, therefore, the capital and labor invested in this industry shall of its own voltion adopt methods that will furnish to the public coal when needed, an outraged public sentiment will furnish the supply by either the army or the penitentiary.

When negotiations are pending looking to a new contract, sixty days before the date thereof the President of the United States should be informed of the facts and principles in controversy, and should appoint some disinterested person to make a report upon these facts and principles so that the public may know whether the operator is receiving a reasonable return upon his investment, the wage earner a living commensurate with American standards, and if not, who is to blame.

(7) When contracts have once been voluntarily entered into, the enforcement thereof should not be left to strikes or lockouts, but the industry itself should provide boards of arbitration — local and appellate — to dispose speedily of these causes in accordance with the terms of the contract and the principles herein set out.

Condemns Violence on Both Sides.—The Commission calls the attention of certain persons in America to a very wise statement made by the Apostle Paul when he said, "All things are lawful to me, but all things are not expedient." Men have, of course, the inalienable American right to go into strange communities and diagnose the evils under which the community suffers and offer remedies for a cure. But many times it is not expedient to exercise this right.: Men not connected with the industry have no right to make inflammatory speeches leading to the use of violence, nor have operators the right to hire gunmen under mere pretense of protecting their property. Both actions are to be condemned. Unionism must justify itself by its wise, sane, conservative and constructive conduct; not by force, threats or intimidation. Non-union operators must justify themselves by the satisfaction of their workmen with their wages and living conditions and not by the use of force and arms.

Notwithstanding the decisions of the Supreme Court of the United States that the so-called "yellow-dog" contract is legal, the Commission is of the opinion that it is a source of economic irritation, and is no more justifiable than any other form of contract which debars the individual from employment solely because of membership or non-membership in any organization. The right of an employer to discharge for disloyalty, dishonesty and incompetency or other unlawful conduct should not be abridged, but he should not be permitted to blacklist a discharged laborer for any other reason than disloyalty, dishonesty or unlawful conduct.

Rights of General Public Must Be Preserved.—As heretofore reported by the Commission there is a vast difference between the rights of individual men and the rights of artificial persons, in the form of *de facto* or *de jure* corporations. These artificial persons are not individual citizens of the Republic. They derive their right to exist from the common consent of the people of this country. In their dealings with each other they must, therefore, take into consideration the fact that the general public has some rights which they are bound to respect. They cannot combine to prevent the mining of coal nor can they agree to such outrageous prices as will work a distinct hardship upon

the citizen. They must deal justly with each other and with the public, making their contracts so as to get a fair return to the owner, a wage commensurate with American ideals to the laborer, and a steady output to the American people.

Regardless of what the law has been in the past, it is the opinion of the Commission that the Congress of the United States must compel full publicity from both operators and United Mine Workers, upon forms prepared and furnished by some governmental agency to the end that the people of America may determine whether they will longer permit, even under governmental supervision, the existence of these artificial persons. They will gladly do so if the corporations work no injury to the common weal, but they will resent any effort to exploit the people by their corporations, *de facto* or *de jure*, or by the united efforts of these corporations.

The Commission reiterates that it is seeking something better for the future than the mere fixing of responsibility for past violations. It does not minimize the gravity of all sorts of crimes which have taken place. It cannot too strongly condemn the custom of permitting either operators or miners to furnish deputy sheriffs, policemen, or other public officials not paid out of the public treasury. That state and local government has not risen to the level of the average idea of justice in America which has not both the will and the power to preserve the life and the property of its citizens.

The Commission condemns equally the lax local government which has seemed to render it necessary for the owner of property to police it at its own expense and in the event of strikes to bring in professional strike breakers, who are frequently better gunmen than they are laborers, and the exercise of that right which inherently belongs to an American citizen, namely that of a stranger voluntarily walking into a community, hiring a hall, and giving that community a lecture on what its rights and duties are. Many good-intentioned people, seeking to serve the common weal, have unwittingly contributed more to crime than to character making.

And finally, if neither the patriotism, private conscience nor business common sense of the industry shall lead all persons engaged in it not only to observe the law but to help enforce the law; and if state and local authorities shall be impotent in prosecuting and convicting violations thereof, then it is the solemn duty of the Congress of the United States to assume jurisdiction over these American rights, bringing the full power of the Union to their preservation by the prosecution and conviction of all persons, whether high or low, who shall dare to violate them.

The legislative, judicial, and executive branches of this government must not permit a union of operators, a union of miners, nor a union of both to become greater than the Union of the States.

JOHN HAYS HAMMOND, Chairman,
THOMAS R. MARSHALL,
CLARK HOWELL,
GEORGE OTIS SMITH,
EDWARD T. DEVINE,
CHARLES P. NEILL.

Attest:
EDWARD EYRE HUNT,
Secretary.

Pinchot Letter to Coolidge Suggests Means To Save Public from Higher Coal Cost

With the anthracite strike on the way to a termination Governor Pinchot on Sept. 9 wrote a letter to President Coolidge, suggesting a means whereby the public need not shoulder the $32,250,000 increase in the production cost of coal necessitated by the 10-per cent wage increase. During the Harrisburg conference the Governor said that the wage increase would result in an added cost at the mines of 60c. a ton to anthracite, and that 10c. of this should be absorbed by the operators and the remaining 50c. by the transportation and distribution agencies. The operators in replying to his proposal said this cost would be 80c., 75c. of it being due to the wage increase and 5c. a ton to the adoption of the eight-hour day. The Governor's letter follows:

"Now that the danger of a strike in the anthracite field is disposed of for two years, I would like not only to thank you again for your telegram of congratulation but to express my very great appreciation of your public approval of the terms of settlement which I suggested, and of the very valuable information which was supplied to me by the U. S. Coal Commission at your direction.

"Both miners and operators deserve great credit for their courtesy, their readiness to consider each others' points of view and their patient willingness to stay on the job. I emphasize the latter particularly because I doubt if any of them had the slightest expectation when they came to Harrisburg that the negotiations would last more than a day or two, or that the strike would be settled.

"A supply of anthracite to the consumer for the next two winters having thus been assured, the next question is that of price. The total legitimate increase in the cost of coal under the terms of the settlement is about 60c. per ton. Of this amount not less than 10c. should properly be taken up by all the operators; many of whom could absorb the whole of the 60c. increase and still make abundant profits.

"In fairness the remainder of the 60c. should never reach the consumer. It is certain, however, that this amount, and probably much more, will be exacted from consumers unless public action is taken to prevent it. Accordingly, since you were good enough to indicate that suggestions from me concerning anthracite would not be unwelcome, I am writing to suggest that real advantage to the public would result if the Interstate Commerce Commission would take up and consider anew the rates charged for the transportation of anthracite coal, with a view to reducing them if justification for such reduction should be found.

"On my part, I propose to ask the Pennsylvania Public Service Commission to consider anew the reasonableness of all freight rates on anthracite within the borders of Pennsylvania.

"I realize that the action of national and state bodies having authority over freight rates on anthracite coal cannot alone solve the problem of fair cost to the consumer. Other factors also have weight, such as efficiency in operating the mines and reasonable profits in distribution. It would greatly assist the public in reaching sound judgments in these matters if the findings of the U. S. Coal Commission on profits and costs in mine operation and in wholesale and retail distribution were made public in great detail at the earliest possible moment. This information will be of the greatest use to me as to others in making plans to protect the public interest.

"The margins and profits of wholesalers, brokers, jobbers and retailers are mainly local matters, which must be dealt with as such. Accordingly, you will, I am sure, be glad to know that I am preparing to invite the Governors of all anthracite-using states to go into this matter with me.

"I am exceedingly glad to tell you that the mining of anthracite is likely to be resumed before the 20th of this month. You will realize as fully as I do the desirability of securing at the earliest possible moment whatever protection can be provided for the consumer against any undue and unnecessary increase in the cost of coal.

"Since the public is a deeply and properly interested party in this matter, and since public opinion will have so large an influence in securing justice, I have taken the liberty of making this letter public in the confident belief that I shall have your approval in doing so."

John L. Lewis, president of the United Mine Workers, sent a letter Sept. 10 to President Coolidge supporting the suggestion of Governor Pinchot that the Interstate Commerce Commission investigate anthracite freight rates. The Governor, Mr. Lewis said, has placed his finger with unerring precision "upon the method by which the consumers of anthracite may be given substantial relief from excessive prices, and the possibility of a future increase."

"The proposals of Governor Pinchot," Mr. Lewis added, "are constructive, reasonable and practicable, and you would be conferring a boon upon the people of anthracite-consuming states if the influence of your high office were directed in support thereof."

Union Leaders and Operators Accept Pinchot's Terms And Sign Two-Year Agreement

The anthracite peace proposal of Governor Gifford Pinchot of Pennsylvania was accepted at Harrisburg by the representatives of the operators on Sept. 6 and by the miners the next day. On Saturday, Sept. 8 the form of the agreement between mine workers and mine owners was drafted. The agreement was indorsed by the union scale committee shortly thereafter and Sept. 17, set as the time for the ratification meeting of the tri-district convention at Scranton.

It is now expected that the strike will formally end Sept. 19, when the men return to work, Sept. 18 being election day. It is probable that the contract which will be drawn upon the form of the agreement will be signed at Harrisburg in the presence of Governor Pinchot on Sept. 19 or 20, probably after mine operations have been resumed.

The contract will run for two-years and incorporate the twelve clauses of the agreement, which include the four Pinchot points and other points raised by the miners at Atlantic City. The four points of the Pinchot proposal are the eight-hour day, the 10-per cent wage increase for all classes of mine workers, recognition of the union through permission to have a union man at the pay windows to collect union dues and recognition of the principle of collective bargaining.

S. D. Warriner, chairman of the General Committee of the Anthracite Operators and spokesman during the conference for the operators, issued the following statement:

"The operators are relieved that a coal shortage has been avoided. While they are of the opinion that conditions did not justify wage increases with added burdens on the public and that the principle of arbitration should be the basis of public protection, nevertheless they were unwilling to assume the responsibility of a protracted suspension in the face of the Governor's proposal."

The drafting of the agreement was as tedious a job as the discussion of the four points of the Governor. On Sept. 6 the operators accepted the Governor's terms, abandoning their requests for a long-term contract if an uneconomic wage was to be provided and also the question of arbitration, temporarily and so far as the present strike is concerned. The following day the miners dropped their demand for the check-off and for an additional increase for day laborers beyond that of the 10 per cent increase for all classifications of mine workers. The miners submitted the question to the union scale committee which indorsed acceptance of the peace plan.

Operators' and miners' representatives, called in by Governor Pinchot in an endeavor to settle the anthracite coal situation, following a recess taken Sept. 1, resumed their efforts to smooth out their differences at the Capitol on Wednesday. The Governor, acting as intermediary, carried specific statements from the miners to the operators and from the operators to the miners. There was no joint session on Wednesday, or on Thursday.

Text of the Two-Year Agreement

Here is the full text of the new two-year agreement signed by representatives of the miners and operators:

"This agreement, made this eighth day of September, 1923, between Districts 1, 7 and 9, United Mine Workers of America, parties of the first part, and the anthracite operators, parties of the second part, covering wages and conditions of employment in the anthracite coal fields of Pennsylvania, witnesseth:

"The terms and provisions of the award of the Anthracite Coal Strike Commission and subsequent agreements made in modification thereof, or supplemental thereto, as well as the rulings and decisions of the Board of Conciliation, are hereby ratified, confirmed and continued for a further period of two years ending Aug. 31, 1925, except in the following particulars, to wit:

"(1) The contract rates at each colliery shall be increased 10 per cent over and above the rates established under the award of the U. S. Anthracite Coal Commission in 1920.

"(2) The hourly, daily or monthly rates of outside and inside company men, working on the basis of an eight-hour day, shall be increased 10 per cent over and above the rates established under the award of the U. S. Anthracite Coal Commission in 1920.

"(3) The hourly, daily or monthly rates of pumpmen and engineers formerly working a twelve-hour cross shift, and changed to an eight-hour basis under the award of the U. S. Anthracite Coal Commission in 1920, shall be increased 10 per cent over and above the rates established by the Board of Conciliation in conformity with said award.

"(4) The hourly or daily rates of consideration miners and consideration miners' laborers shall be increased 10 per cent over and above the rates established, under the award of the U. S. Anthracite Coal Commission in 1920.

"(5) The rates paid contract miners' laborers shall be increased 10 per cent over and above the rates established under the award of the U. S. Anthracite Coal Commission in 1920, said increase to be paid by the operator and miner by adding 10 per cent to the portion of the rate now assumed by each.

"(6) Outside and inside company men working on the basis of a day in excess of ten hours, shall be placed on the basis of an eight-hour day. The rate of pay for an eight-hour day shall be adjusted in the same manner as rates were adjusted for hoisting engineers and pumpmen who were changed from a twelve-hour day to an eight-hour day in 1920, subject to the same increase of 10 per cent provided for other company men under clause 2 hereof.

"(7) Outside and inside company men working on the basis of a nine- or ten-hour day shall be placed on the basis of an eight-hour day. The rates of pay for the eight-hour day shall be the rates for the nine- or ten-hour day paid under the agreement of 1916, plus $1.80 per day for outside employees and $2 per day for inside employees, plus 17 per cent and subject to the same increase of 10 per cent provided for other company men under clause 2 hereof.

"(8) Monthly men coming under the agreement of Sept. 2, 1920, and working on a basis in excess of eight hours per day shall be placed on the basis of an eight-hour day. The monthly rates for the eight-hour basis shall be the monthly rates paid under the agreement of May 5, 1916, plus $54 per calendar month for outside employees and $60 per calendar month for inside employees, plus 17 per cent (except where modified by ruling of the Board of Conciliation) and subject to the same increase of 10 per cent provided for other company men under clause 2 hereof.

"(9) The colliery rate sheets of the different collieries shall be brought up to date, shall be signed by the company officials and the mine committees, and shall then be filed with the Board of Conciliation. In case of dispute as to the correctness of any rate the rate shall be determined by the board, after hearing. In such cases the burden of proof shall rest with the party taking exception to the fi'ed rate.

"(10) A grievance referred to the Board of Conciliation shall be answered within fifteen days and shall be heard within thirty days from date of filing with the board. Decision shall be rendered by the board, or case shall be referred to an umpire, within thirty days after hearing. In case of reference to an umpire, the decision of said umpire shall be rendered within thirty days from date of reference.

"(11) Rates for new work, such as opening a seam of coal, shall be made collectively as between the Mine Committee and the company officials on the basis of the standard recognized rates paid for similar work under similar conditions in the mine in question or adjacent mines. In case of disagreement the matter shall be adjusted through the Board of Conciliation in the manner now customary. Pending decision by the board, work shall proceed at rates set by the foreman and which shall not be less than the

standard recognized rates aforesaid. No contracts shall be made with individual employees at less than the prescribed scale rates or not in keeping with customary practices. This section shall not be construed to deny to the operator the right to change the method of mining.

"(12) The Board of Conciliation is hereby authorized to undertake and complete a thorough study of all wage scales before the expiration of this contract and submit the same to the next joint conference. If the Board of Conciliation shall, by unanimous vote, recommend the adjustment of any inequities or inequalities in wage rates during such study, the adjustment shall take effect on a date set by the board."

Coal Commission Issues Warning Against Pyramiding by Middlemen

Warning against the operations of speculative jobbers in the event of a cessation of mining Sept. 1 was given in a statement issued Aug. 29 by the U. S. Coal Commission. Investigations have disclosed, the Commission stated, that prices were forced up last winter by the multiplicity of transactions by middlemen, which resulted in a pyramiding of profits.

The Commission's statement was intended to put the public on its guard against runaway fuel prices if the efforts to avert a strike fail.

"The U. S. Coal Commission," said the statement, "believes it opportune to make public more details on the subject of pyramiding middlemen's profits, described in the July 5 report by only a single paragraph.

"The Commission's inquiry regarding the source of high-priced anthracite sold during the winter of 1922-23 leads to the conclusion that the speculative jobber or wholesaler was a prime cause of the extremely high premiums paid for anthracite during the recent shortage in New England, as well as in other parts of the country.

"Under normal conditions wholesalers have a proper place in the distribution of coal. They furnish an outlet for the coal of small mines whose total tonnage is too small to warrant the maintenance of a selling organization. In times of normal market, competition among wholesalers for the operators' available tonnage on the one hand and for the consumers' and retailers' trade on the other keeps margins and prices low and commensurate with the services rendered as distributors of coal. In time of a panic or sellers' market, however, the independent wholesalers tend to become speculators, and buy and sell among themselves, thereby pyramiding margins and advancing prices without rendering any equivalent service in bringing the coal nearer to the consumer.

"The wholesalers whose activities resulted in premium prices last winter are, nominally at least, not directly connected with the mines producing the coal, although there are a considerable number of cases in which operators and wholesalers, while separate and distinct corporations, are related through interlocking stock ownerships, interlocking directorates and interlocking officers. In some cases the interrelations extend to a chain of operators and wholesalers.

"In times of sellers' market anthracite is passed from one to another of these closely related interests, each taking a profit on the transaction with the result that wholesale margins are pyramided and the consumer pays extremely high prices and profits to a group of related interests. In other cases the pyramiding results from speculative buying and selling among wholesalers who are separate and independent. Many cases of pyramiding of margins both by related interests and among really separate and independent wholesalers have been traced by the Commission.

"Anthracite coal especially yields itself to speculation among wholesalers whenever there is an interruption of production due to strikes, railroad disability or any other cause. In tracing carloads of high-premium anthracite coal purchased by New England retailers last winter it was found that as many as four wholesale purchases and sales sometimes intervened between the mine and the retailer. More than half of the 750 cars of anthracite coal of domestic sizes traced passed through the hands of only one wholesaler at margins varying from 20c. to $3 per gross ton. Margins frequently taken were 50c., 75c., $1.25, $1.75 and $2.50 per gross ton, the majority of margins being between 50c. and $1.25 per ton.

"A considerable proportion of the cars traced, however, went through the hands of two wholesalers at margins varying from 25c. to $4.75 per ton. In the case of the carload on which $4.75 was taken the first wholesaler took 50c. and the second $4.25 per gross ton.

"Total margins taken by wholesalers on cars passing through the hands of three jobbers ranged from 68c. to $4.03 per gross ton. On two cars sold to the same retailer for which the total of margins taken was $4.03, the first wholesaler took 15c., the second $2.73, and the third $1.15, and on a third car for which the total margin was $4.03 the margins taken by three jobbers were respectively 15c., $2.90 and 98c. per gross ton. A loss of 50c. per ton by the third wholesaler intervening in the sale of one carload, was the only loss reported by wholesalers on the 750 cars of domestic sizes traced.

"On a small number of cars passing through the hands of four jobbers, the total margins taken on individual cars ranged from $1 to $2.25 per gross ton. On the car for which margins amounted to $2.25 per ton the first wholesaler took 25c., the second 40c., the third 35c. and the fourth $1.25 per ton.

"Some mining companies were found to have had special arrangements with wholesalers by which the mine billed the coal to the wholesaler at the prices approved by the Pennsylvania Fair Practices Committee with the understanding that if the wholesaler sold the coal at a price above the mine price billed plus a stipulated wholesale margin or commission, the wholesaler remitted the balance to the operator. Other mining companies sold coal to individuals, in some cases their own officers, at prices agreed upon with the Fair Practices Committee. These individuals then sold the coal to other wholesalers at higher prices. Such practices applied especially to shipments to destinations outside the State of Pennsylvania, thus indicating the ineffectiveness of state regulation of prices at the mine over coal entering into interstate commerce.

"Should a stoppage of mining occur on Sept. 1, it will accentuate the already panic demand for anthracite and unless the buyer and the retailer representing him learn from past experience unscrupulous wholesalers will have another opportunity to repeat their speculative activities of last fall and winter on any anthracite coal that may be on the market after Sept. 1, as well as following the resumption of mining. In the absence of any definite regulatory powers over either mine prices or wholesalers' margins on the part of the state and federal authorities, the extent of such activities and the amount of premium added by wholesalers will depend largely upon the willingness of the retailer and the consuming public to pay the prices demanded. It is only with the retailer's consent that the middleman may receive as much in margin as the coal miner receives in wages from the same ton of anthracite."

THE COAL COMMISSION has been meeting daily both morning and afternoon working on its final reports which are to be submitted on or before Sept. 22, when the life of the Commission will expire. The final report of the Commission not only will be of particular interest to the bituminous industry but also will carry general conclusions and recommendations applicable to anthracite and bituminous alike. It is expected that the Commission will issue previous to its final report certain sectional reports bearing on specific phases of the problems on which it was directed by Congress to make inquiry.

SEVERAL BRIEFS WERE FILED with the Coal Commission last week by the Bituminous Operators' Special Committee. Among the most important was one regarding transportation of coal, in which it was stated that the problem of obtaining an even flow of coal with supply and demand cannot be solved merely by improving transportation machinery without controlling seasonal fluctuations in demand, interruptions of production through strikes, etc.

Miners' Union Attacks Civil Rights Report

In a statement issued Sept. 10 attacking the report of the U. S. Coal Commission on the subject of violation of civil rights in the coal-mining industry the United Mine Workers of America says the report reads like a well-prepared brief in behalf of the non-union bituminous-coal operators of West Virginia and northeastern Kentucky. "Those non-union operators should immediately hold a meeting and give a rising vote of thanks to the Commission for that report," says the statement. "In the first place, the Commission lacks but one hair of giving approval to the employment by these non-union coal companies of private armed guards, thugs and gunmen, in spite of the fact that these desperadoes roam at will over the mountains of West Virginia and Kentucky with a roving commission to assault, beat up, blackjack and shoot members of the United Mine Workers of America who dare to suggest that the employees of these companies join the union.

"The Commission denounces union organizers for daring to go into these non-union fields and ask unorganized men to join the union. In other words, the report clearly attempts to place upon the United Mine Workers of America the blame for what happens in these non-union fields. Why did not the Commission declare that non-union coal companies have no right under the law or the Constitution to use force and coercion to prevent their men from voluntarily asserting their right to affiliate with a labor union?

"The Commission devoted much space to telling of crimes which it says were committed by union miners, but it did not even mention the scores of crimes of company thugs and gunmen that were brought directly to the attention of the Commission by the United Mine Workers. . . .

"One of the very significant statements in the report says that 'the United Mine Workers of American have paid more than $400,000 in damages for the destruction of the Willis Branch Coal Co.'s mines.' The United Mine Workers of America never paid any such sum for damages for the destruction of the mines of the Willis Branch Coal Co. or any other company. If the Commission's fund of information upon which it based its conclusions is not more authentic on other points than it is on this one the report is not of much value from the standpoint of facts and the public is not going to get value received for the $600,000 of the people's money which the Commission has spent."

U. M. W. Allege Communist Move to Control Unions and Overthrow U. S. Government

How the Communist International of Moscow, working through the Communist revolutionary movement in America, is trying to gain control of the labor unions, and by that means overthrow the Government of the United States, is set forth in a series of six articles made public by the United Mine Workers of America at Washington this week. They reveal the efforts made to wreck the trade union, particularly the Mine Workers organization, the purpose of the exposé being to inform the American people of the scope and purport of the "hostile and inimical movement being carried on within their midst."

The overthrow and destruction of the government, with the establishment of an absolute and arbitrary dictatorship, and the elimination of all forms of popular voice in governmental affairs, is being attempted in a more gigantic scale, with more resolute purpose, and with more crafty design, than at any time in the history of the nation, it is declared.

The organization in this country is composed of more than 6,000 active leaders and lieutenants, and approximately 1,000,000 members, adherents and sympathizers, scattered in every state and province of the United States and Canada.

Efforts of the Communists to get control of the miners' union have continued since last year's strike ended with the agreement at Cleveland. In the first two months of this year these efforts centered on the proposition of bringing about an "outlaw" strike on April 1; later to drive a wedge into the United Mine Workers through the advocacy of government ownership of mines, in connection with which it is declared the miners' union has not approved or adopted any plan for nationalization of the mines but adds that a committee was appointed to make a report with recommendations at the next convention of the union to be held next January.

The Herrin massacre is elaborated upon by the miners' organization, saying it was engineered by Communist agents, who according to their own statements, were engaged for seven weeks in preparation for the outbreak.

The Communists have attempted to "bore from within" organizations wherever possible in order to further their ends, having been particularly active against the United Mine Workers, because, besides being the largest single labor organization in the country, it is the nearest approach, in their opinion, to a "one big union," which is their conception of a labor union and their objective for all labor unions. The same tactics have been used for four years to seize and control the American Federation of Labor, the railroad labor unions, and the various other trade groups.

Working partly in the open, the Workers Party of America, it is charged, is another revolutionary organization, created under instructions from the Communist International, by the Communist Party of America. It is known as the "legal" party and its primary purpose is to shield the "underground" or "illegal" party. The mission of this party, it is declared, is fundamentally the same as that of the Communist Party of America.

Another organization, assisting the two revolutionary parties, as one of their direct subsidiaries, is the Trade Union Educational League. This League, it is charged, is cultivated and promoted by the Communists and Workers Parties and is the direct instrumentality of Lenin and Zinoviev, of the Communist International, and Losovsky, of the subsidiary Red Trade Labor Union International, for amalgamating the labor unions into the world revolutionary movement of the Communists.

The Communists are hopeful that a nationwide strike of coal miners will take place next April, and with that end in view agents are working among the miners in Pennsylvania, Ohio, Indiana, Illinois, West Virginia and the Southwest.

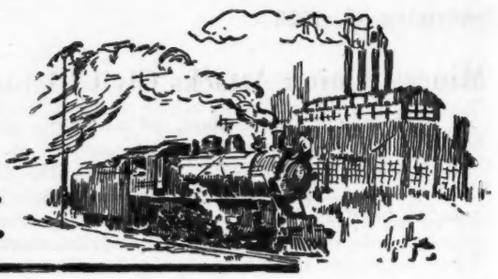
Unconstitutional to Regulate Prices and Profits, Say Bituminous Operators

Regulation of prices and profits in the coal industry would be unconstitutional in normal times, according to a statement filed Sept. 1 by the Bituminous Operators' Special Committee with the U. S. Coal Commission. The Constitution of the United States, says the brief, forbids regulation of such a private competitive industry as coal mining, except in times of war or national emergency, citing in proof the decision of the Supreme Court on the Kansas Industrial Court Act, where Chief Justice Taft referred to coal mining as a business which could not be regulated.

The brief has special reference to a statement on accounting and finance filed with the Commission by the United Mine Workers last June. While this latter dealt with the anthracite industry in particular, the bituminous operators point out that the public is likely to make no sharp distinction between soft and hard coal.

The miners proposed plans for financing the coal industry that would involve eventual nationalization of the mines. Prior to this nationalization, it suggested that the mines be so regulated to give a 6 per cent return on the "investors' sacrifice." The operators contend that these proposals involve three fundamental fallacies: (1) That investors in coal properties are not entitled to profit by increase in the value of their property; (2) that regulation of profits in the coal industry is possible and desirable; (3) that accounting considerations may be made to govern in determining the facts of the industry. The first of these, according to the operators, is in reality a suggestion that the institution of private property be abolished, for the cardinal element of that institution is the fact that it allows the owner to benefit by increase in property value. Moreover, they propose that no compensation be given for possible loss and no reward for risks run, efficiency of management or good business judgment.

Production and the Market



Weekly Review

Settlement of the anthracite strike on the basis of Governor Pinchot's original four points is now assured and the wages and prices have been pegged up for two years. The coal trade is now waiting to see what the Governor can accomplish in cutting freight rates and distributor's margins.

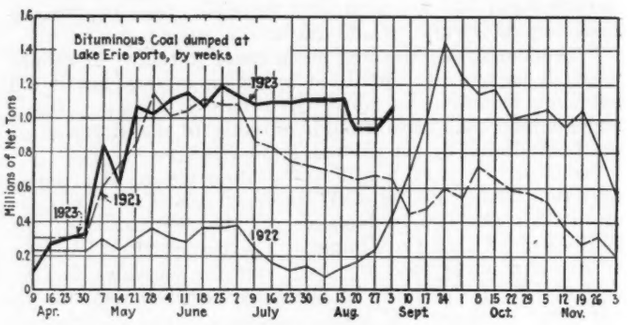
With few exceptions, and then only in slight flurries, did the coal market in any part of the country show any improvement which could be attributed to the suspension of anthracite mining. Inquiry for soft coal increased in various sections, but prices were affected but little. For the third consecutive week *Coal Age* Index shows a slight advance in the average price of soft coal, registering 205 on Sept. 10, an increase of one point, with an average price of $2.49.

Country Well Prepared for Strike

The country was in excellent condition to forego the trouble which would have been occasioned by a much longer strike of the miners. There are upward of 57,000,000 net tons of soft coal in consumers' reserves and the output of anthracite during the coal year to Aug. 31 is estimated at 42,521,000 net tons, the largest production for any corresponding period since 1918. Production of hard coal in five days during the last week before the strike was 1,896,000 net tons.

Another high record for weekly output of soft coal was recorded during the week ended Sept. 1 with production amounting to 11,633,000 net tons, an increase of 250,000 tons over the previous week, which was the weekly record of that time. The output for the first 207 working days of 1923 was 368,706,000 net tons, which has not been exceeded since 1918, when it was 393,093,000 tons, and in 1917, when production amounted to 368,651,000 tons.

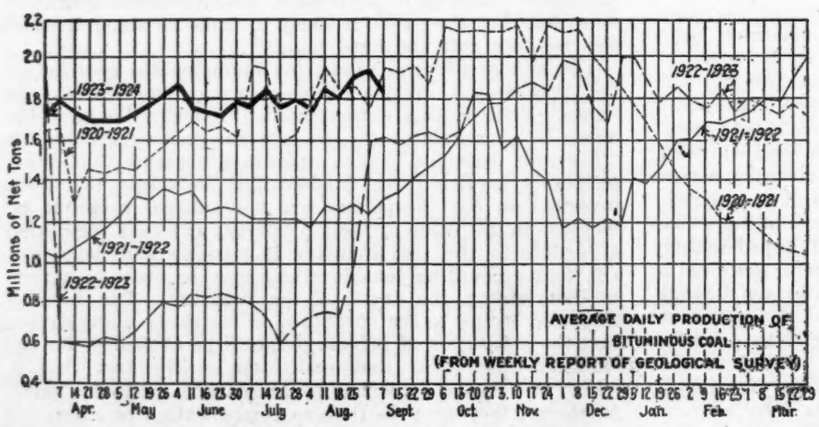
The ending of the anthracite trouble and the feeling that the danger point has been passed placed householders in the Middle West on easy street, with the result that there is no rush for any of the domestic fuels. Buying is slow in New England and even retail dealers have plenty of coal on hand to meet a possible emergency. Shutdowns and curtailments in industrial plants are frequent. Inquiry for bituminous screened coals fell off somewhat. The week's idleness of the anthracite mines failed to created any considerable uneasiness among the dealers or consumers. It was estimated that approximately 75 per cent of hard-coal consumers had at least a part of their winter's fuel in their bins and that the balance could use substitutes. With the strike apparently settled wholesale and retail dealers expect that within a comparatively short time production will have been sufficient to supply all orders.



LAKE COAL DUMPED
(Net Tons)

	Week Ended Sept. 3	Season to Sept. 3
Fuel	977,385	18,859,934
Cargo	63,494	982,346
Totals	1,040,879	19,842,280

Inquiries for coke were numerous and considerable buying was reported by some producers. In some instances the larger sizes were asserted to be sold up. Inquiries of producers continued as far south as Birmingham, Ala. Buying of heating coke by Eastern dealers is fairly active.



Estimates of Production

(Net Tons)

	1922	1923
BITUMINOUS		
Aug. 18	4,609,000	10,843,000
Aug. 25 (*a*)	6,736,000	11,383,000
Sept. 1 (*b*)	9,359,000	11,633,000
Daily average	1,560,000	1,939,000
Calendar year	232,918,000	368,706,000
Daily av. cal. year	1,122,000	1,939,000
ANTHRACITE		
Aug. 18	38,000	1,858,000
Aug. 25	37,000	2,165,000
Sept. 1 (*a*)	37,000	1,896,000
COKE		
Aug. 25 (*b*)	116,000	327,000
Sept. 1 (*a*)	138,000	322,000
Calendar year	4,223,000	13,173,000

(*a*) Subject to revision. (*b*) Revised from last report.

Chicago Trade Is Normal

Nothing has excited the coal trade in and around Chicago lately. The blow-up of the anthracite strike plus assurances from at least one official source has made householders feel that there is plenty of coal on hand, more ready to come, and nothing threatening to boost the price of most domestic coals much. The general result is that no rush is noticeable for any sort of domestic fuel. Yards are fairly well stocked with anthracite, Illinois and Indiana lump and Eastern smokeless at reasonable prices. Steam buyers are disappointed, as they have been counting on lump demand to lower the price of screenings.

Better conditions are noted in the retail call for coal in St. Louis, although this is not for anthracite, smokeless coal or coke. The greatest call seems to be for a high-grade bituminous purchasable below the top circular. The feeling prevails that coal is too high. Business is good in St. Louis only in spots and the demand is not general yet.

Louisville Retail Trade Wakes

The Louisville coal trade reported a stiffer market, due largely to the fact that domestic sizes are moving much better. Retailers, as usual, are buying on a rising market, and the anthracite strike drove domestic consumers to cover. Prices of prime lump and block coal are advancing.

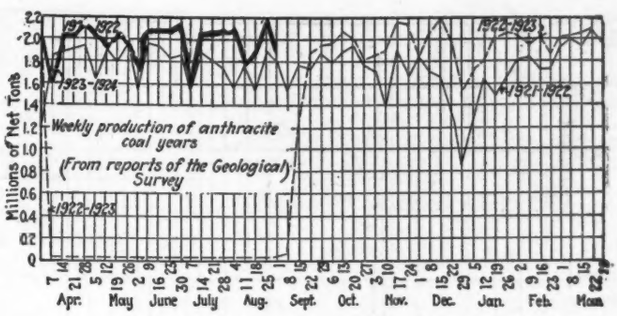
In eastern Kentucky the actual loading market appears at around $3.50@$3.75, with some coal quoted at $4, while there are plenty of rumors of $4.25 coal.

Most of the eastern Kentucky demand appears to be from retailers wanting domestic sizes. Industrials are taking screenings nicely. Mine-run is generally slow in movement.

While the western Kentucky coal trade is doing some kicking, the section is producing a lot of coal. From Aug. 25 to Sept. 1 inclusive the field produced 4,100 cars. The market is unsettled, but firmer.

Northwest Business Is Brisk

A record in shipments from the Duluth docks was established last month, when 23,914 cars were sent out. This compares with 18,911 cars in July and 20,313 in August last year. Heavy shipments of anthracite, railroad and public-utility coal are going out now. On the whole selling is brisk. The Duluth market in both hard and soft coal is strong and shows every indication of higher prices soon. Shipments have fallen off slightly with only forty-five cargoes delivered last week, and of these only three were of hard coal.


Millions of Net Tons
Weekly production of anthracite coal years
(From reports of the Geological Survey
1922-1923
1923-1924
1921-1922
Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar.

The market is brisk in Milwaukee. Stove size anthracite is running a little scarce and the tendency on all coals is toward stiffer prices, though there has been no change in retail quotations on either coal or coke thus far this month. Dealers are not making contract prices, fearing an increase at the mines. Receipts to Aug. 31 were 601,000 tons of hard coal and 1,822,000 tons of bituminous.

Utah operators are finding it difficult to fill orders for lump owing to soft market for slack and intermediate sizes. Working time is around three days a week. A 50c. increase in retail prices is expected. The demand for domestic grades of Southwestern coal continues to stiffen as September advances. There has not, however, been a corresponding increase in demand for steam sizes. Few shut-down mines have reopened.

Ohio Markets Calm Down

There has been a demand for 4-in. and domestic lump coals at Cincinnati. It was hard to move steam run of mine and steam slack, but even with an oversurplus there

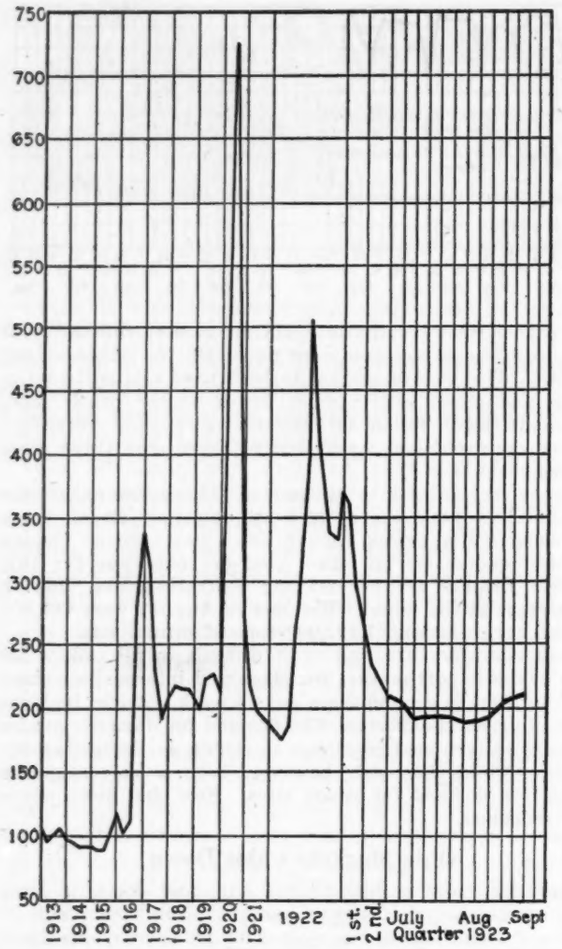
Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern	Market Quoted	Sept. 11 1922	Aug. 27 1923	Sept. 1 1923	Sept. 10 1923†
Smokeless lump	Columbus	$6.40	$5.85	$5.95	$5.75@$6.15
Smokeless mine run	Columbus	5.75	3.00	3.00	2.75@ 3.25
Smokeless screenings	Columbus	5.65	2.35	2.35	2.25@ 2.50
Smokeless lump	Chicago	6.10	6.35	6.35	6.25@ 6.50
Smokeless mine run	Chicago	6.00	3.35	3.35	3.25@ 3.50
Smokeless lump	Cincinnati	7.00	6.10	6.25	6.00@ 6.50
Smokeless mine run	Cincinnati	5.50	3.25	3.25	3.00@ 3.50
Smokeless screenings	Cincinnati	5.50	2.75	2.50	*2.00@ 2.75*
*Smokeless mine run	Boston	8.35	5.05	5.10	*5.00@ 5.15*
Clearfield mine run	Boston	5.00	2.20	2.20	*1.85@ 2.50*
Cambria mine run	Boston	5.50	2.85	2.85	2.50@ 3.25
Somerset mine run	Boston	5.10	2.50	2.50	2.25@ 2.75
Pool 1 (Navy Standard)	New York	.....	3.25	3.25	3.00@ 3.50
Pool 1 (Navy Standard)	Philadelphia	.....	3.10	3.10	**3.00@ 3.40**
Pool 1 (Navy Standard)	Baltimore	.....	.....	.....	.....
Pool 9 (Super. Low Vol.)	New York	5.25	2.50	2.55	2.35@ 2.75
Pool 9 (Super. Low Vol.)	Philadelphia	5.60	2.55	2.55	2.45@ 2.75
Pool 9 (Super. Low Vol.)	Baltimore	6.10	2.50	2.45	2.40@ 2.50
Pool 10 (H.Gr.Low Vol.)	New York	4.80	2.25	2.25	*2.10@ 2.30*
Pool 10 (H.Gr.Low Vol.)	Philadelphia	5.30	2.15	2.15	2.00@ 2.35
Pool 10 (H.Gr.Low Vol.)	Baltimore	5.75	2.25	2.25	2.25@ 2.30
Pool 11 (Low Vol.)	New York	4.35	2.00	2.00	**1.90@ 2.05**
Pool 11 (Low Vol.)	Philadelphia	4.85	1.80	1.85	**2.00@ 2.30**
Pool 11 (Low Vol.)	Baltimore	4.85	1.90	1.90	**2.00**
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	5.15	1.75	1.70	**1.70@ 1.90**
Pool 54-64 (Gas and St.)	Philadelphia	4.60	1.80	1.85	1.70@ 2.00
Pool 54-64 (Gas and St.)	Baltimore	4.60	1.85	1.85	*1.75*
Pittsburgh sc'd gas	Pittsburgh	.....	2.90	3.00	**2.95@ 3.10**
Pittsburgh gas mine run	Pittsburgh	.....	2.45	2.50	2.45@ 2.60
Pittsburgh mine run (St.)	Pittsburgh	4.65	2.45	2.30	2.25@ 2.35
Pittsburgh slack (Gas)	Pittsburgh	.....	1.55	1.55	1.50@ 1.60
Kanawha lump	Columbus	6.40	3.05	3.05	**2.85@ 3.50**
Kanawha mine run	Columbus	6.00	1.85	1.90	1.75@ 2.10
Kanawha screenings	Columbus	5.75	1.05	1.15	**1.15@ 1.25**
W. Va. lump	Cincinnati	7.00	3.50	3.60	**3.50@ 4.00**
W.Va. Gas mine run	Cincinnati	7.00	1.75	1.80	1.65@ 2.00
W. Va. Steam mine run	Cincinnati	5.65	1.75	1.80	1.65@ 2.00
W. Va. screenings	Cincinnati	5.40	1.20	1.35	*1.10@ 1.35*
Hocking lump	Columbus	6.25	2.75	2.75	**3.00@ 3.25**
Hocking mine run	Columbus	5.65	1.85	1.85	**1.85@ 2.00**
Hocking screenings	Columbus	5.40	1.10	1.10	**1.15@ 1.30**
Pitts. No. 8 lump	Cleveland	5.75	2.65	2.65	2.35@ 3.00
Pitts. No. 8 mine run	Cleveland	5.10	2.10	2.10	2.05@ 2.15
Pitts. No. 8 screenings	Cleveland	5.10	1.35	1.35	1.25@ 1.40

Midwest	Market Quoted	Sept. 11 1922	Aug. 27 1923	Sept. 1 1923	Sept. 10 1923†
Franklin, Ill. lump	Chicago	$5.40	$4.20	$4.20	$4.00@$4.35
Franklin, Ill. mine run	Chicago	4.75	3.00	3.00	2.75@ 3.25
Franklin, Ill. screenings	Chicago	4.90	1.65	1.80	*1.65@ 1.85*
Central, Ill. lump	Chicago	4.95	2.60	3.10	3.00@ 3.25
Central, Ill. mine run	Chicago	4.50	2.20	2.20	2.10@ 2.35
Central, Ill. screenings	Chicago	4.30	1.40	1.40	*1.25@ 1.40*
Ind. 4th Vein lump	Chicago	5.25	3.35	3.35	3.25@ 3.50
Ind. 4th Vein mine run	Chicago	4.85	2.60	2.60	2.50@ 2.75
Ind. 4th Vein screenings	Chicago	4.60	1.55	1.60	1.50@ 1.75
Ind. 5th Vein lump	Chicago	5.10	2.75	2.75	2.50@ 3.00
Ind. 5th Vein mine run	Chicago	4.65	2.10	2.10	2.00@ 2.25
Ind. 5th Vein screenings	Chicago	4.40	1.40	1.40	*1.30@ 1.40*
Mt. Olive lump	St. Louis	.....	3.00	3.10	3.00@ 3.25
Mt. Olive mine run	St. Louis	.....	2.00	2.05	2.20@ 2.30
Mt. Olive screenings	St. Louis	.....	1.50	1.35	**1.40@ 1.50**
Standard lump	St. Louis	4.65	2.50	2.60	2.50@ 2.75
Standard mine run	St. Louis	2.85	1.85	2.05	1.80@ 2.30
Standard screenings	St. Louis	3.35	1.00	1.00	*.90@ 1.00*
West Ky. lump	Louisville	4.75	2.40	2.55	**2.50@ 2.75**
West Ky. mine run	Louisville	4.25	2.10	1.90	**1.85@ 2.10**
West Ky. screenings	Louisville	4.00	1.05	.90	**.90@ 1.05**
West Ky. lump	Chicago	4.25	2.75	2.75	2.50@ 3.00
West Ky. mine run	Chicago	4.25	1.60	1.75	**1.85@ 2.10**
South and Southwest					
Big Seam lump	Birmingham	$3.95	$3.50	$3.75	$3.65@$3.90
Big Seam mine run	Birmingham	3.30	1.95	1.95	1.75@ 2.15
Big Seam (washed)	Birmingham	3.80	2.35	2.35	2.25@ 2.50
S. E. Ky. lump	Chicago	4.25	3.10	3.10	**3.00@ 3.25**
S. E. Ky. mine run	Chicago	4.25	1.80	1.80	**1.90@ 2.75**
S. E. Ky. lump	Louisville	6.25	3.00	3.10	2.75@ 3.50
S. E. Ky. mine run	Louisville	5.65	1.85	2.0	1.75@ 2.25
S. E. Ky. screenings	Louisville	5.25	1.10	1.20	1.00@ 1.40
S. E. Ky. lump	Cincinnati	7.00	3.25	3.75	3.50@ 4.00
S. E. Ky. mine run	Cincinnati	5.50	1.70	1.80	*1.50@ 2.00*
S. E. Ky. screenings	Cincinnati	5.40	1.15	1.45	*1.00@ 1.65*
Kansas lump	Kansas City	6.00	4.50	4.50	4.50
Kansas mine run	Kansas City	5.00	3.50	3.50	3.50
Kansas screenings	Kansas City	2.75	2.60	2.60	2.50@ 2.75

* Gross tons, f.o.b. vessel, Hampton Roads.

† Advances over previous week shown in **heavy type**, declines in *italics*.



Coal Age Index of Spot Prices Bituminous Coal F.O.B. Mines

	1923			1922
	Sept. 10	Sept. 1	Aug. 27	Sept. 1
Index	205	204	202	427
Weighted average price	$2.49	$2.47	$2.44	$5.17

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913, 1918," published by the Geological Survey and the War Industries Board.

were practically no concessions in prices. One upward flurry tells the whole story of the anthracite strike so far as that market is concerned. Conditions calmed down but the market has retained what it gained at that time. Smokeless lump and egg hold strong, and some producers and selling agents claim to be sold up for the month. The strike in the hard-coal fields resulted in a better tone in the Columbus market. Buying is more liberal and prospects are considered much brighter. The best feature is the retail demand, many householders coming into the market for their winter supply. Steam coal demand is also showing an improvement, some purchasers getting anxious and disposed to stock up. Railroad demand is fair and utilities purchase heavily. Operators and jobbers serving the Cleveland territory say that the flurry caused by the anthracite situation began to subside as soon as there were indications of a settlement.

The Pittsburgh market has been distinctly quiet as to actual business and inquiry. The reduced demand is matched by reduced offerings. Instead of buying as it were from hand to mouth, buying recently has been in larger quantities, with the result that operators now find themselves in comfortable positions, although they have the same customers as formerly and the rate of shipping has not changed materially.

Business Scarce in New England

In New England there continues a great dearth of spot business. Except for scattering purchases that amount to very little in aggregate tonnage there is almost a complete absence of buying. The large industries are in no different situation than during July and August.

Coals from central Pennsylvania share the general dullness. Buyers are frankly not interested and there is no real encouragement for September and October. More than a few contracts undertaken in May for delivery through the summer have suffered cancellation at the hands of the purchaser for no other reason than the fact that fuel consumption has fallen far below what was relied upon as a normal season.

At Hampton Roads there is only a light movement coastwise. Spot sales are few and far between.

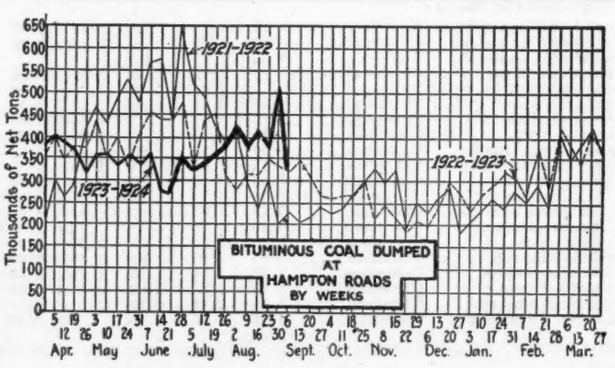
Seaboard Markets Unruffled

In the territory served by the New York market the idleness of the anthracite mines failed to create any excitement. Demand and inquiry remained dull. Inquiry for the bituminous screened coals fell off, but coke was in good call and prices generally showed advances. Conditions, so far as demand for soft coal is concerned, were similar in the Philadelphia market. Numerous producers expected better business, and while it is not visible there is a belief that there was a slight improvement. Consumers have come into the market and it is believed the autumn outlook is more than fair. Baltimore buyers are not inclined to buy heavily, now that the hard-coal strike has been settled, as it is not evident to them that soft-coal prices will change to any great extent. In West Virginia there has not been as much activity as might have been expected as a result of the anthracite mine suspension.

Anthracite Prices Fluctuate

The settlement of the strike in the anthracite mines materially changed the market so far as quotations for independent hard coals were concerned. Prices fluctuated considerably during last week, every day bringing new quotations based upon developments in the negotiations at Harrisburg. While quotations as high as $14.75 for the domestic coals were reported on Thursday, these had dropped more than $2 on Monday of this week and the indications pointed to further concessions. About the only coal offered in the New York market was in boats, and prices were quoted alongside. Washery egg, stove and chestnut sizes were offered around $12.50 at loading points but there was little buying, dealers believing that the miners would soon return to work. There was some offering and buying of briquets at $6.35@$8. There was considerable inquiry for Welsh anthracite, mostly from New England, although dealers from New York also asked prices. It is reported that two cargoes are due to arrive in New York in about ten days.

DUE TO THE SUSPENSION OF MINING in hard-coal fields and the practical stoppage of shipments from the mines, quotations are merely nominal, and are not printed. *Coal Age* quotations on anthracite will be resumed when the new prices are available.


Thousands of Net Tons
1921-1922
1922-1923
1923-1924
BITUMINOUS COAL DUMPED AT HAMPTON ROADS BY WEEKS
Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar.

Foreign Market And Export News

Storms Delay Loading of Welsh Coals; Output Gains Slightly

Increased stocks of the lower grades of coal, due to delays in loading because of recent storms, are reported from the South Wales market.

Output of coal in Great Britain's mines during the week ended Aug. 25 was 5,163,000 tons, says a cable to *Coal Age*. This compares with 5,124,000 tons in the previous week, and 5,148,000 tons in the corresponding week of last year.

Though more active than last week the coal market in Wales is comparatively quiet. As a general rule supplies are in excess of demand, except in the case of one or two special brands. European buyers are cautious due to the state of the exchanges. France, Belgium and Italy are holding back, and the German business is slow.

On the other hand European stocks are undoubtedly low, and this, combined with the gradual decline in the price of Welsh coal, leads to the belief that the Continental demand must revive before long.

The situation in the U. S. anthracite field was watched closely, and Welsh anthracite operators were preparing for a possible increase in demand.

The Newcastle market seems to be gradually going from bad to worse. It is hoped that September will see an improvement. Inquiries are at their lowest ebb and contractors are taking only minimum requirements.

There are several inquiries circulating in Newcastle which may lead to a temporary improvement.

Hampton Roads Market Dull

The situation at Hampton Roads was dull last week, with an appreciably dropping off in exports and with a number of vessels reported en route for cargoes failing to appear. The piers dumped on an indifferent schedule, purchasers appearing reluctant to come in the market under present conditions.

Shippers were anxiously awaiting the outcome of the hard coal miners' strike, with the general belief that some settlement would be reached before the situation became serious. Contracts were not considered pending the outcome of this controversy.

Coastwise business showed some increase, as did the bunker trade, the export business alone falling off. Some leading shippers expressed the opinion this foreign trade would not be likely to increase this winter. The tone of the market was dull.

United States July Exports By Custom Districts

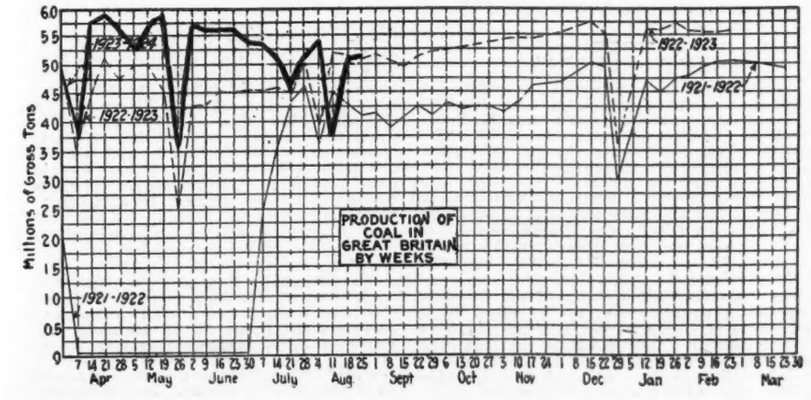
(In Gross Tons)

	Anthracite	Bituminous	Coke
Maine and New Hampshire	.....	1	268
Vermont	1,677	615	1,099
Massachusetts	12	.....	.....
St. Lawrence	136,143	159,742	881
Rochester	73,722	83,489	13
Buffalo	207,800	253,655	23,449
New York	11,196	4,092	168
Philadelphia	11,651	30,960	3,504
Maryland	2	195,296	.....
Virginia	4,274	433,956	270
South Carolina	.....	11,671	.....
Florida	.....	3,556	302
Mobile	.....	1,793	31
New Orleans	5	258	2,534
Galveston	.....	3	.....
San Antonio	.....	401	255
El Paso	192	2,547	875
Arizona	.....	3,534	2,790
Los Angeles	11	3	.....
San Francisco	2	150	5
Washington	132	343	.....
Alaska	4	.....	.....
Hawaii	3,563	.....	.....
Montana and Idaho	.....	30	.....
Dakota	.....	3,207	968
Duluth and Superior	1,795	1,059	133
Michigan	88	113,009	13,166
Chicago	.....	.....	9,751
Ohio	3,101	974,871	.....
Totals	455,370	2,278,241	60,462

French Mines Meet Demand

Output of French industrial coals are sufficient to meet the demand, although shipments from the mines are delayed. This condition is believed to be but temporary, as hopes are entertained for better deliveries from the Ruhr. Consumers are not inclined to buy any more British coal than absolutely necessary, because of the high prices.

House coals supplies are low and if no improvement occurs before fall there will be insufficient stocks on hand to meet the winter demand. Inquiry is expected to increase during the month.



Export Clearances, Week Ended Sept. 8, 1923

FROM BALTIMORE

	Tons
For France:	
Br. SS. Rathlin Head	7,600
Dan. SS. Yokohama	4,140
Fr. SS. Capiteinode Masne	6,597
For Germany:	
Ger. SS. Porta	4,639
For Canada:	
Am. SS. Willfaro	999
Nor. SS. Havur	4,757
For Italy:	
Ital. SS. Aster	10,573
Ital. SS. Ida	6,182

FROM PHILADELPHIA

For Brazil:	
Br. SS. Rio Blanco, for Rio de Janeiro	——
For Cuba:	
Nor. SS. Stabell, for Havana	——
For France:	
Br. SS. Bankdale, for Marseilles	——
For Nova Scotia:	
Br. Schr. Arthur H. Zwicker, for Halifax	——

FROM HAMPTON ROADS

Philippine Islands:	
Amer. Schr. Rachek, for Manapla	702
Canada:	
Ital. SS. Stromboli, for Three Rivers	6,958
Amer. Schr. Velma M. Hamlin, for St. Johns	1,595
Canary Islands:	
Amer. Schr. Anandale, for Santa Cruz de Teneriffe	2,189
Holland:	
Br. SS. Ethelwolf, for Amsterdam	6,582
Dominican Republic:	
Amer. Sch. Horace M. Bickford, for Santo Domingo	602
Cuba:	
Br. SS. Berwindvale, for Havana	7,388

Hampton Roads Pier Situation

N. & W. piers, Lamberts Pt.:	Aug. 30	Sept. 7
Cars on hand	1,259	1,403
Tons on hand	73,967	81,979
Tons dumped for week	145,847	108,351
Tonnage waiting	11,000	1,500
Virginian Ry. piers, Sewalls Pt.:		
Cars on hand	1,791	1,904
Tons on hand	104,350	111,140
Tons dumped for week	121,460	107,952
Tonnage waiting	4,000	7,042
C. & O. piers, Newport News:		
Cars on hand	2,047	2,372
Tons on hand	107,265	120,688
Tons dumped for week	188,714	90,602
Tonnage waiting	.....	6,005

Pier and Bunker Prices, Gross Tons

PIERS

	Sept. 1	Sept. 8†
Pool 9, New York	$5.35@$5.75	$5.35@$5.75
Pool 10, New York	4.75@ 5.25	4.75@ 5.25
Pool 11, New York	4.50@ 4.75	4.50@ 4.75
Pool 9, Philadelphia	5.20@ 5.65	5.25@ 5.70
Pool 10, Philadelphia	4.60@ 5.10	4.65@ 5.25
Pool 11, Philadelphia	4.15@ 4.50	4.35@ 4.80
Pool 1, Hamp. Roads	5.25	5.25
Pools 5-6-7, Hamp. Rds	4.60@ 4.75	4.35@ 4.50
Pool 2, Hamp. Roads	5.00	5.00

BUNKERS

Pool 9, New York	5.65@ 6.05	5.65@ 6.05
Pool 10, New York	5.05@ 5.55	5.05@ 5.50
Pool 11, New York	4.80@ 5.05	4.80@ 5.05
Pool 9, Philadelphia	5.60@ 6.00	5.60@ 6.05
Pool 10, Philadelphia	5.00@ 5.50	5.00@ 5.50
Pool 11, Philadelphia	4.50@ 4.95	4.65@ 5.00
Pool 1, Hamp. Roads	5.25	5.25
Pool 2, Hamp. Roads	5.00	5.00

Current Quotations British Coal f.o.b. Port, Gross Tons

Quotations, by Cable to *Coal Age*

	Sept. 1	Sept. 8†
Admiralty, large	29s.	28s.6d.@30s.
Steam smalls	20s.@21s.	20s.
Newcastle:		
Best steams	23s.@24s.	24s.@24s.6d.
Best gas	23s.6d.@24s.	24s.@24s.6d.
Best bunkers	22s.@23s.	22s.6d.@24s.

News Items From Field and Trade

ALABAMA

The Townley Coal Co. has been incorporated in Townley, with a capital of $50,000, by M. K. Lang, R. Voight and others.

The Morrison Coal Co. has been incorporated in Birmingham by A. K. Foster, Vernon M. Brown and others.

ARKANSAS

Hiram Fuller, who resides on the Warren and Pine Bluff road about six miles from Pine Bluff, while digging water well on his farm **struck a vein of peat** at a depth of 90 ft.

COLORADO

The Boulder Valley Coal Co. plans to make extensive improvements on its property in Lafayette.

ILLINOIS

The W. G. Hughes Coal Co., Chicago, has just been incorporated with a capital stock of $30,000, to deal in coal mines. The incorporators are C. I. Abbate, W. G. Hughes and K. R. Leva.

Appointment of W. H. Smithburne as general sales manager of the Great Lakes Coal & Coke Co. has been announced. Mr. Smithburne has been connected with the Bickett Coal & Coke Co. for sixteen years, during the last seven of which he was secretary of the firm. Previous to this he was associated with the Burlington R.R.

The validity of Chicago's bulk load weight ordinance, which has been the subject of much dispute, is **soon to be settled.** Following the unsuccessful attempt, recently, to secure an annulment of the law by means of an injunction, the matter is to be fought out in the courts on an appeal of a conviction. Although 123 firms and individuals have joined the fight, there are but two exclusive coal dealers included, most of the petitioners being dealers in building materials.

Shafts are swiftly sinking, a railroad is under construction and a town is laid out at Nason, in Jefferson County, where the **Illinois Coal Corporation is building its new mine,** planned to be a 10,000-tonner. The two shafts were down about 150 ft. on July 4 and three miles of the Jefferson & Southwestern RR., owned by the corporation, were built. A recent sale of town lots disposed of considerable property.

INDIANA

In order to relieve the coal cars for commercial service during the coming months, **the Fort Wayne division of Pennsylvania R.R. is storing its winter supply of coal at** various points along the line. A total of 85,000 tons is allotted the division. Of this amount 45,000 tons will go to Fort Wayne, Ind. The fuel is being stored in the east yards and is being unloaded at the rate of 700 tons a day.

KENTUCKY

The See-See Coal Co. has been incorporated in Pineville, with a capital of $75,000, by R. I. Cawthorne, E. R. Martin and others.

B. D. Williams and Adolph Woodruff, of Mannington, Ky., and W. W. Minter, of Memphis, Tenn., have organized the **Jellico Coal Co.** with $500,000 capital for mining coal in the Whitesville section.

NEW YORK

Pattison & Bowns, Inc., of New York City, announce that as of Sept. 1 they **succeeded the firm of Williams & Peters as sales agents for the Pennsylvania Coal Co.** and affiliated companies, and have the exclusive sale of Pittston coal in the Eastern territory. They will conduct this business as their Pittston division. The unfilled orders of Williams & Peters will be entered on their books and unless countermanded by the parties who have placed the orders with them will endeavor to make shipments subject to the usual terms and conditions. Pattison & Bowns have taken over the offices and staff of Williams & Peters and, as far as possible, will conform to their sales policies. The business of the Pittston division will continue to be conducted from Room 1014, Whitehall Building, formerly the offices of Williams & Peters.

According to the New York State Committee on Public Utility Information, which has made a survey of the stocks on hand, the **gas companies of New York State have in reserve more than 300,000 tons of anthracite,** which is equivalent, on the average, to a five months' supply for those companies making gas from anthracite exclusively. In addition to this, plants using soft or "gas" coal have on hand, according to the latest information, a three months' supply on the average.

Harold C. Knapp, formerly of the Irving Bank-Columbia Trust Company, has assumed the position of **trust officer of the Coal and Iron National Bank of the City of New York,** succeeding Arthur A. G. Luders, resigned. Mr. Knapp was graduated from the New York University Law School in 1908 and, being admitted to the bar, practiced law until 1918. He then joined the Irving Trust Co. Mr. Knapp is a member of the faculty of the New York University School of Commerce and Finance and the co-author of a volume entitled "Wills, Estates and Trusts."

OHIO

The Tuscora Coal Co., Coshocton, has been chartered with a capital of $25,000 to operate mines in the Tuscarawas field. Incorporators are D. E. Morris, W. H. Morris, Mathew Banks Charles W. Banks, Albert F. Baier and J. G. Gamble.

Additional contracts for coal for various state institutions have been awarded by the Ohio Board of purchase as follows; Ohio Building, Columbus, 1,500 tons of Hocking nut, pea and slack, Burns Coal Co., at $3.49 delivered; State School for the Blind, Columbus, 2,000 tons of Hocking nut, pea and slack, Burns Coal Co., Columbus, at $3.49 delivered; State House, Columbus, 1,500 tons of Hocking mine-run, Burns Coal Co., Columbus, at $4.24 delivered; Wyandotte Building, Columbus, 500 tons of Hocking mine-run, Burns Coal Co., Columbus, at $4.24.

The Dominion Coal Co., of Columbus, chartered several weeks ago with an authorized capital of $25,000, has been organized by the election of K. W. Rittenhouse as president and D. F. Shaffer as secretary and treasurer. The company will be exclusive sales agent for the Standard Coal Co., at Nelsonville, and will also engage in the general jobbing business. D. F. Shaffer is the owner of the Standard Coal Co. mines. K. W. Rittenhouse was formerly sales manager of the Consolidated Mining Co. of Columbus.

A series of accidents on Aug. 30 in Belmont County, across the river from Wheeling, **resulted in one man being killed and four other injured** in the mines.

OKLAHOMA

The Bull Creek Coal Co., of which A. D. Rushmart, Locust Grove, is manager, has 120 acres of coal land near Inola, under development and is installing a steam shovel and other equipment.

PENNSYLVANIA

Anticipating an increased demand for crushed coal as a domestic and heating fuel, **two new crushers have recently been installed** in the Connellsville field. The Reliance Coal & Furnace Co., at its Denbo plant in the lower Connellsville field, has its crusher well on the way to completion, while the Mahoning Coal & Coke Co. is making rapid progress with its crusher at the Peerless works in the Connellsville district. Other crushing plants which have not been in operation for some time are being overhauled.

The Clearfield Bituminous Coal Co. has awarded a contract for the erection of a new modern tipple at its Clymer mine to the Pittsburgh Coal Washing Co. It will be equipped with screens, picking tables, rock-handling conveyors, and will be able to load coal with the rock conveyor.

While the mine suspension is on officials of the **Wolfe Coal Co. is working on plans to open up a stripping operation** in close proximity to their mines at Lattimer. A valuable bed of coal will be unearthed as soon as the suspension is over. A large tract of timber land has to be cleared at the stripping site. The timber cut will be utilized in and about the mines when operations resume.

Cosgrove & Co., coal operators and shippers at Johnstown, **have purchased the R. L. Sproat mine operations and coal holdings near Windber.** With the purchase of the Sproat interests, a new firm was formed, which will be known as the Windber Standard Coal Co., with H. J. Meehan, an officer of Cosgrove & Co. and of the Cosgrove & Meehan Coal Corporation as president, and John C. Cosgrove, president of the Cosgrove & Co., as secretary-treasurer of the new firm. A charter for the firm has been applied for. The new owners have taken charge of the newly acquired operations and are making arrangements to increase the output. Modern equipment has been ordered and work on a new mine opening will be started at once, it is announced.

Graham Bright, formerly general engineer in charge of the coal and metal mining department of the Westinghouse Electric & Manufacturing Co., who has joined the firm of Howard N. Eavenson & Associates, mining engineers, of Pittsburgh, was the guest of honor Aug. 14 at a farewell dinner given at the Edgewood Country Club,

GRAHAM BRIGHT

Pittsburgh, by his friends of the industrial company with which he was connected for twenty-one years. Mr. Bright will give special attention to power-house systems, power-plant appraisals, transportation and transmission systems for coal and metal mines and general industrial power application.

The first skirmish to their battle for a lower and more uniform coal valuation was won recently by owners of Greene County coal lands who appealed the 1922 triennial coal assessment. Judge G. G. Sloan, president judge of the Clairton County courts, sustaining the objections of the Shannopin Coal Co. and other appellants, ordering the coal valuation returned to the 1921 figures and the refunding of the excess taxes collected by the county and townships from the appellant coal owners. Under the ruling of the court, however, taxes will be refunded only to those who joined in the appeal of the assessment. Altogether there were about 200 appellants, but the only hearing held was on the appeal of the Shannopin Coal Co., a holding corporation of the Jones & Laughlin Steel Co., which owns a block of about 14,000 acres of Pittsburgh coal in Greene, Perry and Dunkard townships. The coal owners complained that the county commissioners had not assessed the coal uniformly and that it was assessed at a higher figure in proportion to its value than the surface. The county commissioners in March, 1922, sitting as a board of revision, raised the coal valuation in every township and borough of the county, the increase ranging from 10 per cent to 60 per cent.

The Olyphant Coal & Coke Co., formerly controlled by the late Senator William E. Crow, on Sept. 5 was **placed in the hands of receivers** by Judge E. H. Reppert. W. W. Parshall, J. W. Abraham and W. L. Byers, of this place, were named temporary receivers. The liabilities were declared to be $423,000 and creditors filed petitions de-

claring that a fair value of the property exceeds the liabilities and that overproduction of coal and the present state of the market made a receivership advisable in order to preserve the equity of the company. The company owns 500 acres of land north of Uniontown.

Possibility of **a legal test of the law passed at the last session of the Legislature, compelling anthracite companies to furnish coal to schools, churches, hospitals and other public institutions** where public health is endangered, may result from inability to obtain a supply of coal from local companies or dealers for St. Mary's German Catholic Church. The bill which compels the companies to furnish anthracite under penalty of a $1,000 fine or a year in prison, was sponsored by Representative Thomas O'Boyle, and was the outgrowth of the situation in Olyphant last winter, when a shortage of coal resulted in the seizure by a body of citizens of several carloads which were distributed among the church and schools in that borough.

Twenty-one teachers of engineering from twenty-one widely searated colleges and universities spent the month of July in the East Pittsburgh works of the Westinghouse Electric & Manufacturing Co. renewing their contact with industry in the interest of better teaching. This is the thirteenth consecutive season that a group of engineering teachers has gathered at the Westinghouse company, and during these years more than four hundred engineering teachers representing every engineering college in the United States and many of the leading institutions in foreign lands have participated in the conferences. Each man was assigned to the department or section of the works in which he would be in contact with the men who could best give him what he wanted. Several of the men went into various kinds of testing, others into engineering departments, and a few into the manufacturing sections. A similar program at which emphasis was entirely on steam equipment was conducted at the South Philadelphia plant of the Westinghouse company.

The executive committee of the Coal Consumers' Association of Philadelphia on Aug. 30 protested against a wage increase to anthracite miners in a telegram to Governor Pinchot as follows.: "We regret to learn that the concessions proposed for settling the anthracite coal controversy include a 10 per cent increase to mine workers and what is equivalent to an acceptance of the check-off. This is not time for advancing costs. The public demands liquidation of all items making up the retail price, including royalties, wages, operators' margin, freight, brokerage and retailers' margin. We are convinced that these features of the proposed plan of settlement are without justification even from the viewpoint of political expediency and we protest against their acceptance."

TENNESSEE

The Crystal Ice & Coal Co., of Erwin, proposes building an addition to its coal tipple.

TEXAS

The Palestine Coal Co. has been incorporated in Palestine, with a capital stock of $150,000, by R. McDonald, T. C. Richey and others.

UTAH

The Blazon Coal Co., through L. F. Rains, president, and A. H. Dennison, secretary, has filed an amendment to its articles of incorporation increasing the capital stock from $200,000 to $300,000.

VIRGINIA

William H. Moore, formerly with the Chesapeake & Ohio Coal & Coke Co., is now with the Fort Dearborn Coal Co. in the capacity of inland sales agent with offices at Norfolk. He is at present at the company's mines in West Virginia, studying conditions.

The Clinch River Coal Corporation, of Virginia, **has purchased the properties of the Odle Coal Corporation.** They are located at Coeburn, on the Pocahontas Division of the Norfolk & Western Ry. and consist of 634 acres. The new owners plan to increase the production of the mines, particularly the domestic sizes. William J. Jegen, of Edge Hill, Pa., is president of the Clinch River company.

WEST VIRGINIA

Coal loadings on the Chesapeake & Ohio Ry. surpassed all previous loadings for any one day on Monday, Aug. 27, when a total of 4,354 cars was reached, equivalent to 217,700 tons based on an average of 50 tons to a car. The best record previously established was on May 8 of the present year, when a total of 4,136 cars were loaded. All monthly records were broken during August, when the company transported 73,700, or a total of 3,685,000 tons, an increase of 301,750 tons over July, when a new monthly record was established.

Notwithstanding the general dullness which has prevailed throughout northern West Virginia during the summer months, **all the Pittsburgh vein operations in the Monongalia field and all but two of the Sewickley mines in the same field have been running virtually on a full-time basis.** The output on Scott's Run is averaging something like 250 cars of coal a day. On the Morgantown & Kingwood mines are being operated on a part-time basis only.

Methods of organization and control of work in the coal mines with particular reference to discipline and supervision as compared with factory discipline **are being investigated in West Virginia mines by Carter Goodrich,** of Amherst College. Mr. Goodrich began his investigation in the Winding Gulf District of West Virginia late in August, being the guest of E. E. White, president of the E. E. White Coal Company and also president of the Winding Gulf Operators Association.

The Tildesley Collieries Co., of Charleston, has been launched by Charleston capitalists with a view to operating in the Kanawha field. The company has an authorized capital stock of $100,000. The incorporators are E. W. Tildesley; V. G. Tildesley, S. S. Tone, P. M. Stone and A. M. Grabil, all of Charleston, W. Va.

The trial of Howard R. Harrah, foreman of the jury which was unable to reach a verdict in the trial of William Blizzard, and who was indicted by a Greenbrier County Grand Jury about a month ago, charged with having accepted $700 to bring about a disagreement on the jury, **has been set for Sept. 17** at Lewisburg. G. Clarence Hickey also will go on trial on that date. Hickey is alleged to be an agent of the United Mine Workers and is alleged to have made the payment of $700 or about that sum to Harrah.

The number of coal companies organized in West Virginia in July was the smallest for the year, only seven, having an aggregate capitalization of $215,000 being formed. In the list of new companies formed were the following: J. W. Powell Coal Co. of Charleston, $15,000; Glen Valley Coal Co. of Wheeling, $50,000; Big Coal Land Co. of Charleston, $25,000; Sugar Creek Coal Sales Co., $50,000; Dell Coal Co. of Charleston, $50,000; Virginia Coal & Coke Agency, Inc., of Huntington, $20,000; Pond Coal Co. of Charleston, $5,000. Seven West Virginia coal concerns, as follows, surrendered their charters durinf July: Princess Coal Co., Richland-Brooke Coal Co., Gorman Coal & Coke Co., Springdale Coal Co., Flynn Coal & Coke Co. and Kildow Coal Co.

Contracts have been awarded by the Consolidated Coal Co. for a large number of new houses of modern design for the occupancy of miners at the Coalwood plant of the company, in McDowell County. Since the Consolidation took over the plant at Coalwood, which is the center of operations of the company's New River-Pocahontas division churches, school houses and club houses as well as many other dwellings have been constructed and innumerable improvements made in accordance with the Consolidation's policy of installing equipment necessary to insure efficiency. The Consolidation bought the mines in the Pocahontas district from the Carter interests some time ago and has been engaged in building up the property ever since.

Thomas Harding, in charge of the pumps at the Glen Rogers shaft mine of the Raleigh-Wyoming Coal Co. at Glen Rogers, of which Carl Scholz is vice president and general manager, is receiving high praise from mining men for an act of loyalty and fidelity recently performed. Late in August he was called from bed about 3 a.m. to learn that both the pumps at the bottom of the shaft of the mine were out of commission and that the sump was filling with water. When Harding arrived at the bottom of the shaft the pump operated by air was entirely submerged and the water was rapidly closing around a large electric pump. Although there was 18 ft. of water in the bottom of the shaft, Harding dived to the bottom four times in order to loosen the air pump and raise it to a higher level where it could be operated. His act saved the mine from flooding.

An attempt to destroy the tiple of the Preston County Coke Co. at Cascade, in Preston, was made on Sunday morning, Sept. 1, when fifty sticks of dynamite was used which had been stolen from the company's powder house. Only crushing machinery was affected. A wash house near the dwelling of a boarding-house keeper also was dynamited a few minutes after the dynamite under the tipple was set off, one corner of the wash house being blown off. A 20 per cent reduction in wages was made on Sept. 1 but an official of the company had nothing to say as to whether he thought the wage reduction had anything to do with the dynamiting. Although the company has at no time had any labor trouble it has been operating on an open-shop basis since the Bethlehem Mine Corporation's strike following the adoption by that company of the open-shop plan.

The National Tax Association has invited everyone interested in taxation to attend, whether members of the organization or delegates or not, its sixteenth annual conference to be held at the Greenbrier, White Sulphur Springs, Sept. 24 to 28. Special emphasis has been placed on the invitation to men in the mining industry. The conference will discuss state income-tax amendments, including the proposals of publicity of income tax returns as provided in Wisconsin; classified against general income taxes, including double taxation. These and other kindred topics of interest to the mining industry are to come up for thorough analysis and it has been recommended that mine owners and operators who will be unable to attend the American Mining Congress conference on mine taxation to be held in Milwaukee, Sept. 24-29, obtain from the governors of their states appointments as delegates to the National Tax Association conference.

A suit for $300,000 instituted in the Circuit Court of Raleigh County **by the Summit Coal Co. against the Raleigh Smokeless Fuel Co.,** for alleged damages, **was won by the defendant company.** In its suit the plaintiff alleged that it had authorized the sales company to contract, for its account, on Jan. 2, 1920, for the sale of 2,000 tons of coal per month, for delivery between April 1, 1920, and April 1, 1921, at a stated price but that the sales company had made false representations to the effect that it had entered into such a contract and the plaintiff company accepting such representations in good faith had shipped the necessary tonnage to and through the agency. Evidence produced went to show that the coal company had given the agency the necessary authority and that the sales company had in fact sold the coal in accordance with instructions given it and at the price fixed in the instructions. It also was developed that the sales company had apprised the coal company as to whom the coal had been sold and that the sales company had furnished the coal as agreed upon. Under the circumstances the court directed a verdict for the defendant.

When **the special convention of the United Mine Workers of District 17 was opened at Charleston** Sept. 5, delegates were present from practically every organized coal field in West Virginia. The convention was called as the result of an agitation waged in northern West Virginia since early in the year for an opportunity to air disputes and grievances growing out of the last election of the United Mine Workers, irregularities being claimed. Insurgent members of the union also are demanding a better accounting of the funds paid into the district treasury. The fact that the sessions of the convention were executive and the fight made over a report favorable to the administration submitted by the committee on rules and order of business, disclosed just how serious is the internal strife between the district officers and the northern section of the district. It was sought by the committee on rules to prohibit the introduction of a motion except by unanimous consent. After protracted debate the report was recommitted to the committee and amended so as to provide that any motion not submitted to the proper committee before noon of Sept. 5 could only be introduced upon a majority vote of the convention.

WASHINGTON

To celebrate the opening of the Jordan Valley Coal mine at Everett, the public was invited to attend a basket picnic at the mine, located between Arlington and Granite Falls, on Sunday, Sept. 2. New machinery is being installed. The picnic featured the formal opening of the mine on a commercial basis.

Announcement has been made by the Quartermaster's Department of the U. S. Army at Seattle that pursuant to instructions received from the quartermaster supply officer, San Francisco General Intermediate Depot, Fort Mason, San Francisco,

Cal., **no award will be made for the quantities of coal** advertised for for Forts Casey, Ward and Worden, Wash., bids for which were opened July 25.

Bids will be opened on Sept. 20 at the Quartermaster's office in Seattle for furnishing and delivering 531 net tons of bituminous lump coal, over 2-in. screen for Fort Casey; 380 net tons bituminous lump coal over 2-in. screen for Fort Ward, and 1295 net tons bituminous lump coal, over 2-in. screen for Fort Worden.

WISCONSIN

Emmet J. Carrigan was appointed receiver for the Valley Coal Co., Milwaukee, by the Federal court in that city on Aug. 24. A petition by the Bickett Coal & Coke Co., of Chicago, alleges that the company admitted liabilities in excess of $100,000, that it had made no sales in a month or more and that it had been keeping afloat on amounts received from past sales. The petition further alleges that the book value of the company is about $67,000, while the actual value is only $24,000.

WASHINGTON, D. C.

By direction of Secretary Work, of the Interior Department, the **Bureau of Mines is planning to begin an investigation of the peat deposits** of the United States. At the request of Senator Fletcher, this will include an inquiry to determine whether peat exists, and to what extent, under the soil of Florida. The bureau has on hand approximately $50,000 from an appropriation for investigation of lignite and peat. Attention thus far has been devoted to lignite, principally in the Dakotas, the matter of peat having been delayed owing to inquiries into that subject by several European countries, to determine the value of their deposits for fuel and for extraction of byproducts, so that this experience might be available to this country as a foundation for its work. Details of the peat investigation will be worked out in the next few months and work will begin in the South, probably this winter.

CANADA

According to official announcement by the Ontario Government machinery for equitable and price-controlled **distribution of fuel throughout Ontario will be continued during the coming winter season by the Provincial Government.**

Frank Hodges, secretary of the Miners' Federation of Great Britain, who is in Canada, said at Montreal recently that with something like 1,500,000 persons practically permanently unemployed in Great Britain, immigration was of primary importance to the British. He added: "I have come with a view to help as much as I possibly can rather than to criticise and I propose to study existing plans." Mr. Hodges is a fraternal delegate to the Trades and Labor Congress of Canada, which meets in Vancouver this month.

Application has been made to the Montreal Stock Exchange for the listing on the unlisted department of the authorized issue of $3,000,000 or 5 per cent first mortgage bonds due 1940 of the Cumberland Railway & Coal Co. In addition to the bonds the company has an authorized capital of 20,000 shares of common stock of $100 par value, all of which is outstanding. Bonds may be called at $105 on any interest date. Officers and directors of the company are: President, R. M. Wolvin; vice-president, Hector McInnes, Halifax; secretary, C. S. Cameron, Montreal; assistant secretaries, W. A. Doig, J. A. Kempton, Montreal; D. H. McDougall, Sydney.

Output for the month of August from the mines of the Dominion Coal Co. was one of the largest since March, 1916, when the grand total output of 379,254 tons was produced, while the output for the past month was 366,246 tons. During the month three of the collieries made new records, namely, Dominion Nos. 6, 11 and 24, while Dominion No. 10 Colliery (Reserve) produced only six tons less than its former record, made in June, 1912. Dominion No. 2, with an output of 72,248 tons, was the best since March, 1916, when the output totaled 74,095 tons. Dominion No. 16 (New Waterford) produced the high figure of 22,171 tons.

Anglo-Canadian Collieries & Refineries, Ltd., of Edmonton, Alta., with an authorized capital of $1,500,000, has been incorporated by Prosper E. Lessard, Guy W. Marriott, Bryce J. Saunders, Sir George B. Filmer and others, of Edmonton.

It is stated that Cape Breton, N. S., companies **are prepared to supply large quantities of coal to New England** centres if a strike of anthracite coal miners causes a fuel shortage there. For various reasons the Canadian market is at present not brisk enough to take all the coal that can be dug in Nova Scotia, and, consequently, there is a large surplus that can be diverted to the States.

In an address before the Canadian Gas Association in Ottawa, J. L. Landt, of the Dominion Fuel Board, **advocated the use of coke in the home,** stating that it was a cheaper fuel than anthracite and yielded good results in prepared sizes.

Alberta operators in session at Calgary took no official action on the proposition to sell Alberta coal in Ontario, taking the view that with the heavy crops to move there would be no cars available for any large quantities of coal.

Miners at the Newcastle and Western Gem mines, Drumheller, Alta., **went on strike** Aug. 30 on account of the employment of non-union men. A mob went to the Western Gem mine to prevent non-unionists from working and a riot broke out, in the course of which two police constables were seriously injured. All Drumheller mines were idle on Aug. 31. Robert Livett, international representative of the U. M. W., stated that the men had acted without consulting the union officials.

George E. Stringer, of Yorkshire, England, head of the British syndicate that has obtained a controlling interest in the Princeton Coal & Land Co., has arrived at Princeton and **will start an active campaign for increased production.** As soon as suitable men are available, the force at the mine is to be increased from its present strength of 125 to 500, with a view to increasing output to 500 tons per day. The mine has been in operation for several years under the superintendence of Francis Glover, who will retain the management of the property. The output of the mine for last year was 19,418 tons, against 13,966 in 1921. The new owners purpose erecting coal bunkers at Vancouver, for the purpose of bunkering ships.

Obituary

Morris L. Painter, for many years actively engaged as a coal operator at Greensburg, died Sept. 1 at his home. He had been ill for many months. Mr. Painter for a long time was vice-president of the Westmoreland National Bank of Greensburg.

Association Activities

Directors of the **West Virginia Coal Association** held a meeting at Charleston when it became inevitable that anthracite miners were going to suspend work. It was pledged that inasmuch as West Virginia has the grade of coal best suited as a substitute for anthracite, the association take every possible step in expediting the mining of coal in order to save the country from distress which otherwise might ensue. A statement issued by the association closed with this paragraph: "We have the coal, we have the mines, we have the workers and we have the equipment to take care of almost any demand made upon us if only we are assured that sufficient railroad equipment will be provided to move the tonnage that we are able to produce."

Traffic News

An investigation into railroad freight rates on anthracite has been ordered by the Interstate Commerce Commission in response to a suggestion by the U. S. Coal Commission. Public hearings will be conducted by the Commission through Examiner Disque, at Pittsburgh, Pa., Sept. 24, at 10 a.m. in the Chamber of Commerce Building. The proceedings will embrace an inquiry into all phases of anthracite coal handling by the railroads including rates, changes, regulations and practices of the carriers.

Class 1 railroads of the United States, according to reports to the Interstate Commerce Commission from 193 roads representing a total mileage of 235,670, **in July earned an annual rate of return of 4.93 per cent** on their tentative valuation as fixed by the commission for rate-making purposes, including additions and betterments up to Jan. 1, 1923. This rate represented a net operating income for the month of $84,591,400. In the eastern district the rate earned was 5.60 per cent; the southern district, 5.26 per cent, and the western district 4.05 per cent. In July last year the same carriers earned a net operating income of $69,321,000, which was at the annual rate of return of 4.12 per cent. In June this year the rate was 5.47 per cent.

The complainants in Docket No. 12,712—**Hood Coal Co. et al. vs. Monongahela Valley Traction Co.** (now Monongahela West Penn Public Service Co.) et al.—filed with the Interstate Commerce Commission Aug. 29 a petition for rehearing and leave to amend complaint, which alleged unreasonable combination rates on coal from mines in independent short lines within certain producing districts and rate groups to interstate destinations on trunk lines.

As a means of more efficiently handling the freight traffic through the Raleigh yards, the **Chesapeake & Ohio is extending a new double track 2,000 ft.** near the roundhouse and near Raleigh. The company also is installing four additional tracks near the Raleigh Coal & Coke Co. plant. In order to make way for the tracks the coal company is moving several houses for the new tracks, which will accomodate several hundred cars. In addition to the new trackage, the company is placing a new coaling station near the roundhouse so that engines may be coaled without delay and within a short distance of the shops.

At a recent hearing of the carriers before the Alabama Public Service Commission on the proposed general coal and coke rates on interstate shipments, the argument was advanced by N. W. Proctor, of Louisville, representing all the interested railroads, that **the burden of proof in proceedings before the Commission is not on the carriers** where the justness of an existing rate is questioned by other interests, or a citation holding that the existence of a rate approved by the commission constitutes prima facie evidence that the rate is fair and reasonable. The adoption of this contention would serve to preclude, it is stated, any general schedule of reduced rates, but would confine adjustments to specific individual complaints from points where representatives held current rates to be unjust.

During the month of August 2,579,225 net tons of bituminous coal and 232,723 net tons of hard coal passed through the canals at Sault Ste. Marie. Of this tonnage 2,557,659 tons of bituminous coal passed through the United States canal, and 21,566 tons through the Canadian canal. Of the anthracite tonnage 222,741 tons passed through the United States canal and 9,982 tons through the Canadian waterway.

From Jan. 1 this year to Aug. 15 **railroads of the United States placed in service 41,982 new coal cars,** 41,712 new box cars and 13,149 new refrigerator cars. Of this number, 6,424 cars were placed in service during the first 15 days in August. On Aug. 15 the roads had on order 80,535 new freight cars, of which 31,946 were coal cars. The roads placed in service from Jan. 1 this year to Aug. 15, 2,364 new locomotives, of which 143 were delivered during the first 15 days in August. In addition they had on Aug. 15, 1,674 new locomotives on order.

The railroads on Aug. 15 had, out of 2,280,440 freight cars on line, **188,635, or 8.2 per cent, in need of repair.** This was a decrease of 379 cars from the number in need of repair on Aug. 1, at which time there were 189,014, or 8.3 per cent.

Coming Meetings

The American Mining Congress will hold its twenty-sixth annual convention in conjunction with the National Exposition of Mines and Mining Equipment, Sept. 24-29, at the Milwaukee Auditorium. Milwaukee. Secretary, J. F. Callbreath, Washington.

National Safety Council will hold its twelfth annual safety convention at the Buffalo Statler Hotel, Buffalo, N. Y., Oct. 1-5. Secretary, W. H. Cameron, 168 No. Michigan Ave., Chicago, Ill.

Fifth annual general Western meeting, **Canadian Institute of Mining and Metallurgy,** Oct. 3-5, at Estevan, Saskatchewan, Canada. Secretary, G. C. Mackenzie, Drummond Building, Montreal, Que., Canada.

The West Virginia-Kentucky Association of Mine, Mechanical and Electrical Engineers will hold its annual meeting Oct. 19-20 at Huntington, W. Va. Secretary-treasurer, Herbert Smith, Robson-Prichard Bldg., Huntington, W. Va.

Coal Mining Institute of America will hold its annual meeting Dec. 19, 20 and 21 at Pittsburgh, Pa. Secretary, H. D. Mason, Jr., Chamber of Commerce Building, Pittsburgh, Pa.